S. Bur. Biological Survey

WILDLIFE REVIEW

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Except as indicated, abstracts are by William H. Stickel, editor.

NATURAL RESOURCES & CLIMATE

Dillon, Lawrence S. (Texas A & M Coll.) WISCONSIN CLIMATE AND LIFE ZONES IN NORTH AMERICA. Sci. 123(3188): 167-176, 13 maps. Feb. 3, 1956.
Serious and useful effort to present a reconstruction of climatic and biogeographic conditions that prevailed at the maximum of the last glacial period. Should be of interest in problems of distribution.

Franklin, T. Bedford. CLIMATES IN MINIATURE. Philosophical Library, N. Y. 137 p., illus. 1955. $3.75. [From review by S. A. Wilde, J. For. 53(12).]
"...this work is written in warm, entertaining language which at times borders on literary achievement... Most of the 15 chapters of the book deal with the writer's first hand observations of micro-climatic conditions in refuges of hibernating rodents, hedgerows, coppice, garden plants and soils that support them, and even bushes providing roosts for blackbirds. To strengthen his thesis the author quotes experiences from elsewhere, e. g., the research of USDA climatologists on cranberry marshes of Wisconsin... Its author demonstrated on concrete examples the decisive effect of local climatic conditions upon the dynamics of organisms."

Stefferud, Alfred, editor. WATER / THE YEARBOOK OF AGRICULTURE 1955. US Dept. Agr. xiii + 751 + 15 unnumbered plates. 1955. $2.00 from Supt. Documents.
Agriculture yearbooks are famous for giving great amounts of reliable, diversified information on important subjects. This one continues the tradition with 96 papers on such topics as water needs; sources of water; water in relation to soils; watersheds and their management; water and forests; irrigation; water in relation to crops, ranges, pastures, gardens, turf, and orchards; drainage of fields; water and wildlife; demands for pure water; future needs. The photographs and some of the graphs are good, but too many graphs, maps, and drawings have been made objectionably crude, no doubt deliberately, with wriggly or jagged hand-drawn lines unpleasantly combined with letterpress type on graphs. It is difficult to believe that this approach is either artistic or popular.

Symposium. DESERT RESEARCH. Proc. Internat. Symposium held in Jerusalem, May 7-14, 1952, sponsored by Res. Council of Israel and UNESCO. Res. Council of Israel (Jerusalem), Spec. Publ. no. 2. xiv + 641 p., illus. 1953. $6.00, paper, from Interscience Publ., 250 5th Ave., N. Y.
Numerous papers dealing with many parts of the world were contributed by such experts as C. W. Thornthwaite, C. E. Kellogg, S. Duvdevani, F. S. Bodenheimer, W. C. Lowdermilk, and Luna B. Leopold. Most papers are in English, a few are in French. Groups of papers deal with climate, biology, soils, land resources, reservoirs, groundwater, and windpower. Some of the biological papers are: The physiology of life and work in high ambient temperatures, by W. S. S. Ladell. Problems of animal ecology and physiology in deserts, by F. S. Bodenheimer. The effects of rain and temperature on plant distribution in the desert, by F. W. Went. Plant introduction, by B. T. Dickson. Chemical components of useful or potentially useful desert plants of North America and the industries derived from them, by P. C. Duisberg. Other papers in the biological section discuss plant ecology of various parts of world, dry zone forestry, water balance of desert plants, microbiology of desert soils, insect phenology, and economic desert plants of Israel.

SOILS

Harradine, Frank F., and others. SOIL SURVEY OF THE MENDOTA AREA, CALIFORNIA. US Soil Cons. Serv., Ser. 1940, no. 18. 1-96 p., illus. + large folding maps. Jan. 1956. $2.00 from Supt. Documents.

Henry, E. F., and others. SOIL SURVEY OF MECKLENBURG COUNTY, VIRGINIA. US Soil Cons. Serv., Ser. 1942, no. 13. 1-116 p., illus. + large folding maps. Jan. 1956. Order from Supt. Documents. Price not stated.

Secor, Wilber, and others. SOIL SURVEY OF DUTCHESS COUNTY, NEW YORK. US Soil Cons. Serv., Ser. 1939, no. 23. 1-178 p., illus. + large folding maps. Dec. 1955. Order from Supt. Documents. Price not stated.

SOILS--Continued

Shrader, W. D., and others. SOIL SURVEY OF ST. CHARLES COUNTY, MISSOURI. US Soil Cons. Serv., Ser. 1939, no. 28. 1-49 p., illus. + large folding maps. Jan. 1956. $2.00 from Supt. Documents.

Taylor, David, and others. SOIL SURVEY OF MONTOUR AND NORTHUMBERLAND COUNTIES, PENNSYLVANIA. US Soil Cons. Serv., Ser. 1942, no. 11. 1-152, illus. + large folding maps. Sept. 1955. $3.75 from Supt. Documents.

CONSERVATION EDUCATION

Burrows, George Howard II. MODEL FOR A WILDLIFE CONSERVATION FIELD GUIDE. Ph.D. thesis, Cornell U. 419 p. 1955. [From long abstract in Dissertation Abstracts 15(11)].

Plan of a proposed book dealing with conservation of mammals and birds of eastern and central U. S. and Can. and w. Greenland, to be treated by species or groups of related species. Planned headings: status, trend, productivity, protection, management. The section on Galliformes is written as an example. The author believes there is popular need of such a book and that through the medium of providing information to the public, it would contribute to the conservation of wildlife. As part of this study, "A survey is made of individual existing popular conservation books segregated into the following periods: 1864-1910, Some Early Conservation Books; 1911-1931, The Fight to Save Wildlife; 1931-1945, Growth of Scientific Management; and 1945-1954, Recent, Post-War Period. The nature and effectiveness of existing nature guides is investigated, with special attention given to size, format, and illustration."--L. F. Stickel.

Holcomb, Lew. (KTNT-TV, Tacoma, Wash.) HOW RADIO AND TV CAN HELP TO SELL GAME AND FISH MANAGEMENT. Proc. 35th Ann. Conf. W. Assn. State Game & Fish Comms. p. 189-194. 1955.

A long article full of good practical advice about how wildlife agencies can best make use of TV. Includes facts on what various states are already doing.

BIBLIOGRAPHIES, DIRECTORIES, BIOGRAPHY, HISTORY

McAtee, W. L. (3 Davie Circle, Chapel Hill, N. C.) ALEXANDER WILSON: FATHER OF AMERICAN ORNITHOLOGY. Nat. Mag. 49(3): 135-136, 164, 2 figs. Mar. 1956.

Life and work.

PLANTS--GENERAL, ECOLOGY, TECHNIQUES

Leatherman, Anna D. ECOLOGICAL LIFE-HISTORY OF LONICERA JAPONICA THUNB. Ph.D. thesis, U. Tenn., 106 p. 1955. [From long abstract in Dissertation Abstracts 15(11).].

In addition to the primary subject material on ecology and life history, information is also included on distribution, variation, economic importance, and regional status of the honeysuckle.--L. F. Stickel.

PLANTS--FLORAS, COMMUNITIES, TAXONOMY

Braun, E. Lucy. (5956 Salem Road, Mt. Washington, Cincinnati 30, Ohio.) THE PHYTOGEOGRAPHY OF UNGLACIATED EASTERN UNITED STATES AND ITS INTERPRETATION. Bot. Rev. 21(6): 297-375. June 1955.

Largely a discussion of floristics and of the causes of the present vegetation pattern. Bibliography of 218 titles.--Neil Hotchkiss.

PLANTS--FLORAS, COMMUNITIES, TAXONOMY--Continued

Hamel, Aubert. (Lab. Serv. des Sci., Ste.-Anne-de-la-Pocatière, Québec) ESQUISSE ÉCOLOGIQUE DES COMTÉS DE L'ISLET ET DE KAMOURASKA. Can. J. Bot. 33(3): 223-250, illus. May 1955.

Describes the environment and vegetation of L'Islet and Kamouraska counties, Quebec, which lie between the St. Lawrence estuary and n. Maine. The principal plant communities are sugar maple, white spruce, red maple-American elm, black spruce, mixed forests, saltmarsh cordgrass marsh, threesquare-wildrice marsh, and cropland.--Neil Hotchkiss.

Hubbell, T. H., A. M. Laessle, and J. C. Dickinson. (U. Mich. & U. Fla.) THE FLINT-CHATTAHOOCHEE-APALACHICOLA REGION AND ITS ENVIRONMENTS. Bul. Fla. State Mus., Biol. Sci. (Gainesville) 1(1): 1-72 p., 10 plates, 4 maps. Jan. 1956. 85¢.

First issue of an attractive and substantial new series that is available by purchase of issues, subscription, or exchange. Summary of this issue: "We have examined the drainage basin of the Flint, Chattahoochee and Apalachicola Rivers in the general vicinity of Chattahoochee, Florida from the standpoint of its physical features and natural regions. A suggested plan for recognition of these natural regions is presented. The major habitats occurring within the area are described, with emphasis being placed upon the plant associations present. Our categories have been compared with those of previous workers who have concerned themselves with this and other areas. Special study areas have been designated as representing typical examples of the major habitats studied."

Jones, G. Neville, George D. Fuller, and others. VASCULAR PLANTS OF ILLINOIS. U. Ill. Press & Ill. State Mus., Mus. Sci. Ser. vol. 6. xii + 593 p., illus. 1955. $10. [From review by Lincoln Constance in Science, Dec. 9, 1955.]

Reminiscent of Deam's Flora of Indiana. "The use of small state-county dot maps to show distribution, the inclusion of a full-page vegetation map, a brief description of the flora and vegetation, an account of the principal collectors, and a full bibliography are a few of the laudable similarities between the two. Jones and Fuller depart from their model principally in omitting all keys and a glossary, in emphasizing full synonymy and recording all published references to Illinois plants, and in stressing orders while abjuring varieties and forms."

McCullough, Herbert A. (Howard Coll., Ala.) SURVEY OF THE GOTHIC NATURAL AREA. Sci. Monthly 82(1): 25-32, 7 figs. Jan. 1956.

Climate, geology, vegetation, and research opportunities of this reserve in the mountains of Colo.

Wallmo, O. C. (A & M Coll. Tex.) VEGETATION OF THE HUACHUCA MOUNTAINS, ARIZONA. Am. Midl. Nat. 54(2): 466-480, 8 figs. Oct. 1955.

Ecological analysis.

Waterfall, U. T. (Okla. A & M Coll.) A CATALOGUE OF THE FLORA OF OKLAHOMA. Okla. A & M Coll., Res. Found. 1-91 p. Oct. 1952. $1.00.

"A list of the ferns and flowering plants growing native or naturalized in the state, with references to pertinent literature."

Whittaker, R. H. (Brooklyn Coll.) VEGETATION OF THE GREAT SMOKY MOUNTAINS. Ecol. Monog. 26(1): 1-80, illus. Jan. 1956.

Impressive ecological analysis.

Wistendahl, Warren Arthur. THE FLOOD PLAIN OF THE RARITAN RIVER, NEW JERSEY. Ph.D. thesis, Rutgers U., 119 p. 1955. [From Dissertation Abstracts 15(11)].

Vegetational ecology.

PLANTS--FOREST SURVEYS

Forest Economics Staff. THE TIMBER RESOURCE IN MARYLAND. US For. Serv., NE. For. Exp. Sta. (Upper Darby, Pa.). v + 41 p., maps & graphs. 1955.

"...shows the area and condition of the forest land, the volume and quality of the standing timber, and the rates of timber growth and mortality, and the extent of timber cutting for forest products."

PLANTS--FOREST SURVEYS--Continued

Minnesota. THE FOREST RESOURCE OF LAKE COUNTY. Office of Iron Range Resources & Rehabilitation, 624 State Office Bldg., St. Paul 1, Minn. 1-64 p., illus. [1955.]

Good account of area and ownership, timber volumes, timber utilization, growth, drain, allowable cut, opportunities for improved management in 9 forest types, and problems of forest management.

WILDLIFE--BIOTAS, ECOLOGY, NATURAL HISTORY

Anon. UPLAND GAME OF CALIFORNIA. Calif. Dept. Fish & Game. 1-39 p., illus. 1955?

Popular, pocket-size handbook of upland game birds and small game mammals. 20 native and 6 introduced species are treated. For most species there is a map showing ranges of subspecies in state, a drawing, and a few paragraphs of information on status, distribution, and/or natural history and management. The 6 introduced species are chukar, ringed turtle dove, Chinese spotted dove, turkey, and eastern gray and fox squirrels.

Eddy, Samuel, and A. C. Hodson. (U. Minn.) TAXONOMIC KEYS TO THE COMMON ANIMALS OF THE NORTH CENTRAL STATES EXCLUSIVE OF THE PARASITIC WORMS, INSECTS AND BIRDS. Burgess Publ. Co., 426 S. 6th St., Minneapolis 15, Minn. v + 141 p., illus. Revised ed. 1955. Paper cover, spiral binding. $3.00.

These keys appear to be useful and well prepared--not perfect, of course, but apparently as good as those found in any but the best specialized works. Many line drawings help in use of keys. A brief glossary is given for each animal group. References to more specialized works are supplied. The book is intended for students who have had some college zoology but who are in no position to delve into animal identification through scores of technical references. Level of coverage is variable: to orders in Protozoa, to families or common genera in some phyla, to common species in other phyla, and to virtually all species of fishes, amphibians, reptiles, and mammals.

WILDLIFE--NATURAL AREAS & REFUGES

Branch of Wildlife Refuges. LIST OF NATIONAL WILDLIFE REFUGES--1955. US F&WS, Wildl. Leafl. 372. 1-11 p. Dec. 1955.

Lists 264 refuges by state or territory, with indications of county where located, date of establishment, acreage, class, and animals for which primarily established.

Various authors. NATIONAL FOREST WILDERNESS IN MONTANA AND IDAHO. Living Wilderness 20(53): 13-27, illus. Summer-Fall 1955.

Maps, describes, and gives useful information about the 11 wilderness areas of these 2 states.

WILDLIFE--NATURE PROTECTION & RARE & EXTINCT SPECIES

Gill, Edmund D. THE PROBLEM OF EXTINCTION, WITH SPECIAL REFERENCE TO AUSTRALIAN MARSUPIALS. Evolution 9(1): 87-92. Mar. 1955. [From J. Mamm. 36(4).]

Kuroda, N. THE PRESENT STATUS OF THE PROTECTION OF BIRDS AND MAMMALS IN JAPAN. Proc. 7th Pac. Sci. Congr. 4: 719-727. 1955. [From Auk 72(4).]

Petrides, George A. (Mich. State Univ.) KENYA'S WILD-LIFE RESOURCE AND THE NATIONAL PARKS. Publ. by Trustees of Roy. Natl. Parks of Kenya. Nairobi. iii + 24 p. Mar. 1955.

The author spent 9 months in Kenya on a Fulbright grant. Here are his findings on wildlife conservation and national park policy. Tourist business is Kenya's 3d most important industry and it depends largely on wildlife. Yet, outside of a few parks, wildlife is given little consideration. Much of it will be gone in 25 years, at present rates. Habitat protection is essential, especially in reference to overgrazing by livestock. Poaching and heavy killing by natives

is important locally and for certain species. The author reviews the circumstances of the major habitats and many species and makes a number of recommendations for altering of policy in respect to parks and reserves, park boundaries, education of Africans to appreciate wildlife resources, and related matters. Human population of Kenya is rising rapidly; what can be done for game and natural areas must be done soon.

Various authors. OUR ENDANGERED WILDLIFE. Natl. Wildl. Fed. (Wash. 12, D. C.). 1-32 p., illus. Jan. 1956.

This pamphlet contains accounts of 14 rare or vanishing animals of the U. S. Each account is 1-1/2 to 2 pages in length; treats history, habits, status and conservation; has a picture of the animal; and is written by an outstanding expert. Olaus J. Murie wrote the foreword. The booklet obviously is designed for extension use but it has some reference value. At the end of the pamphlet are listed 8 courses of action to save endangered wildlife. The species accounts, each of which is available separately, are: Grizzly bear, by Robert F. Cooney. Whooping crane, by Robert P. Allen. Sea otter, by Raymond M. Gilmore. Lake sturgeon, by John Van Oosten. Key deer, by Gerald F. Baker. Trumpeter swan, by Winston E. Banko. Everglade kite, by Alexander Sprunt, Jr. Eskimo curlew, by Ludlow Griscom. Grayling, by Perry H. Nelson. Ivory-billed woodpecker, by James W. Tanner. Lake trout, by James W. Moffett. California condor, by Carl B. Koford. Attwater's prairie chicken, by V. H. Lehman. Bighorn sheep, by Helmut K. Buechner.

WILDLIFE--MORPHOLOGY, PHYSIOLOGY, BEHAVIOR, MIGRATION

Davis, David E. (Johns Hopkins Sch. Hygiene, Balt. 5, Md.) ECOLOGICAL BASES OF ORIENTATION. Proc. of a Conf. on Orientation in Animals. Office Naval Res. (Wash., D. C.) p. 183-192. 1954. [From J. Mamm. 36(4).]

Garn, Stanley Marion. (Fels Res. Inst., Antioch Coll.) APPLICATIONS OF PATTERN ANALYSIS TO ANTHROPOMORPHIC DATA. Ann. N. Y. Acad. Sci. 63(4): 537-552. Nov. 28, 1955.

In comparing animal populations with regard to size and shape of body, the use of combinations of measurements, or "Patterns," is advised as against the measurement-by-measurement approach.--V. B. Scheffer.

Swift, Lloyd W. (US For. Serv., Wash., D. C.) THE NEED OF WILDLIFE FOR DRINKING WATER. US Dept. Agr., Ybk. Agr. 1955. p. 586-588. 1955.

Brief statement of water needs of various birds and mammals and how the needs are met in nature.

Weikel, J. H., J. F. Bonner, and W. F. Neuman. (U. Rochester.) SKELETAL GROWTH OF THE RAT. Proc. Soc. Exp. Biol. & Med. 88(1): 122-124, 3 graphs. Jan. 1955.

Approach may have value in study of other animals. Summary: "The applicability of a graphical presentation of skeletal weight data as a function of body weight on log-log graph paper to the Rochester strain of rat and to individual components of the skeleton has been demonstrated. It has also been shown that the function relating to the two variables is the same as for a previously described colony. Further, the variations demonstrated among the components of the skeleton preclude the use of any one bone as quantitatively representative of the skeleton as a whole. However, an equation for comparing the growth rates of the different bones, which require only the weights at two ages, has been proposed."

WILDLIFE--EFFECTS OF CHEMICALS, WEATHER, CARS, ETC.

Aubry, J., M. Gatineau, and L. Saint-Léger. NOTE SUR LA TOXICITÉ DU TOXAPHÈNE A L'ÉGARD DU PIGEON, DU COQ ET DU RAT BLANC. Ann. Épiphyties (Paris) Livraison du no. 2 de 1954. p. 199-202. 1954.

Reports tests of acute and chronic poisoning of pigeon, chicken, and rat with toxaphene.

DeWitt, James B. (Patuxent Refuge, Laurel, Md.) TOXICITY OF CHLORINATED INSECTICIDES TO QUAIL AND PHEASANTS. Atlantic Nat. 11(3): 115-118. Jan.-Feb. 1956.

Summary and conclusions: "Residues from insecticidal applications of chlorinated hydrocarbons may remain toxic for extended periods. In experiments designed to furnish information on the effects upon quail and pheasants of prolonged feeding upon diets containing small percentages of these compounds, it was shown that aldrin, dieldrin and endrin are cumulative, and that quail are unable to survive after ingesting 5-10 mg./kg. of aldrin, 30-50 mg./kg. of dieldrin, or 6-15 mg./kg. of endrin. Maximum levels (p.p.m.) in the diets permitting survival for extended periods were: DDT, 200; strobane, above 500; aldrin, 0.5; dieldrin, 1.0; endrin, 1.0. Inclusion of these compounds in the diets of breeding quail and pheasants affected hatchability of eggs and viability of chicks, even though the adult birds appeared unaffected." Detailed figures are given for all points mentioned.

Genelly, Richard E., and Robert L. Rudd. (U. Calif., Davis.) CHRONIC TOXICITY OF DDT, TOXAPHENE, AND DIELDRIN TO RING-NECKED PHEASANTS. Calif. Fish & Game 42(1): 5-14, graphs. Jan. 1956.

"In the fall test, 3 out of 10 females on 600 p.p.m. of DDT died within 57 days; 1 out of 10 females on 200 p.p.m. of DDT died after 90 days. During the spring test, all 4 males exposed to 400 p.p.m. of DDT died, while 20 females survived similar conditions. Such sexual difference in susceptibility to DDT corroborates earlier observations. Thirty-three pheasants, including three males, survived exposure to toxaphene fed for two to three months, even at the highest level (300 p.p.m.). Dieldrin proved most fatal to pheasants. In the fall, 6 out of 10 females at 200 p.p.m. died within 28 days, and 5 out of 10 females at 100 p.p.m. died within 38 days. In the spring, 8 out of 20 females and all 4 males at 50 p.p.m. died within 74 days. The only male tested at 25 p.p.m. died, while 21 females survived. With dieldrin as with DDT, the males appear to be more susceptible to poisoning than are the females." Weight declines were roughly proportional to degree of poisoning with toxaphene or dieldrin. Birds on DDT tended to gain weight. All birds examined chemically and histologically had a high concentration of insecticide in fat or showed marked damage to liver cells, or both. There is little field evidence of chronic poisoning of game by insecticides in Calif. Recommended application rates of DDT are not high enough to cause much chronic mortality. Use of toxaphene and dieldrin may cause acute mortality, depending on rate of application.

Horsfall, Frank, Jr. (Va. Poly. Inst.) RODENTICIDAL EFFECT ON PINE MICE OF ENDRIN USED AS A GROUND SPRAY. Sci. 123(3185): 61. Jan. 13, 1956.

"Endrin has been 100-percent effective in each of the past 3 years as a pine mouse control." In experiments described, various concentrations and preparations of endrin were applied as ground sprays. Limited evidence is presented that little if any damage was done to other wildlife. [For other papers on effect of endrin and related compounds on wildlife, see DeWitt, WR 82 p. 7, as well as DeWitt, and Genelly and Rudd, in this issue of WR.]

Ward, Justus C. (USDA, Wash.) HOW TOXIC ARE TODAY'S PESTICIDES? Pest Control 24(1): 9-10, 12. Jan. 1956.

Table 1 gives acute oral toxicity to laboratory rats of 20 insecticides and 11 rodenticides. Table 2 gives single dose dermal toxicity to rabbits of 17 insecticide preparations. Table 3 gives multiple dose dermal toxicity to rabbits of 8 insecticides. Table 4 gives computed comparative toxicities to man of 8 commonly used rodent baits. Text discusses safety in use of these agents.

WILDLIFE--POPULATIONS & FLUCTUATIONS

Nicholson, A. J. (Commonwealth Sci. & Indus. Res. Organization, Canberra.) COMPENSATORY REACTIONS OF POPULATIONS TO STRESSES, AND THEIR EVOLUTIONARY SIGNIFICANCE. Aust. J. Zool. 2: 1-8. 1954. [From long, informative review by M. E. Solomon, J. Anim. Ecol. 24(2).]

Population dynamics in cultures of blowflies.

WILDLIFE--POPULATIONS & FLUCTUATIONS--Continued

Nicholson, A. J. AN OUTLINE OF THE DYNAMICS OF ANIMAL POPULATIONS. Aust. J. Zool. 2: 9-65. 1954. [From long, informative review by M. E. Solomon, J. Anim. Ecol. 24(2).]

Based in part on studies of blowfly cultures, but the greater part of this paper "sets out a deductive theory of population regulation which can be considered separately. It is put forward as a framework for experimental and theoretical work to be published later."

WILDLIFE--BIOMETRICS

Chapman, Douglas G. (U. of Wash.) A MATHEMATICAL STUDY OF CONFIDENCE LIMITS OF SALMON POPULATIONS CALCULATED FROM SAMPLE TAG RATIOS. Internat. Pac. Salmon Fish. Comm. Bul. 2, Problems in Enumeration of populations of spawning sockeye salmon. New Westminster, B. C. p. 67-85. 1948.

An excellent contribution to the calculation of confidence limits for population estimates obtained by tag-recapture methods. Criteria to determine the best method of finding confidence limits are presented. These criteria are easily understandable by persons possessing a limited background in mathematics. This paper should be in the library of all persons interested in population estimation of mammals or fish.--V. Schultz.

Chapman, Douglas G. (U. of Wash.) POPULATION ESTIMATION BASED ON CHANGE OF COMPOSITION CAUSED BY A SELECTIVE REMOVAL. Biometrika 42(3/4): 279-290. Dec. 1955.

"The assumptions involved in this method appear to be simpler and more likely to be fulfilled than those underlying other population estimation procedures. Moreover, it will be shown that non-fulfillment of some of the assumptions may involve no serious consequences. This is one of the phases of the method studied in this paper. To be balanced against this is the fact that the amount of information yielded is smaller for the same effort than is obtainable from the more usual method of estimation based on the recapture of marked members of the population. A quantitative comparison is given below of the two methods. Some problems of optimum design in the sampling that accompanies a change of composition estimate are considered and some extensions of the procedure studied."--V. Schultz.

Chapman, D. G., and R. Pyke. (U. of Wash.) THE STATISTICAL THEORY OF SOME MIGRATION POPULATION MODELS. Biometrics 11(4): 508-510. Dec. 1955.

Abstract only. "The problem considered is that of estimating the parameters associated with the migration of individuals between two areas..."--V. Schultz.

Fields, Paul E. (U. of Wash.) FACTORIAL DESIGNS AND THE GUIDANCE OF DOWNSTREAM MIGRANT SALMON AND STEELHEAD TROUT. Biometrics 11(4): 508. Dec. 1955.

Abstract only.--V. Schultz.

Kinashi, Kenkichi. FOREST INVENTORY BY SAMPLING METHODS Bul. Kyūshū U. Forests. No. 23. 153 p. Mar. 1954. [Cited from reprint.]

Consists of 6 parts: Introduction, Direct Sampling Estimate, Indirect Estimate, The Error in Single Measurement, The Estimate for Large Areas, and Conclusions. These parts contain a total of 44 chapters on various phases of the application of modern statistical methods to forest mensuration. Those of interest to wildlife workers include plot efficiency, systematic and stratified sampling, most efficient plot shape, autocorrelation of strips, and line plot methods for small areas and strip methods.--V. Schultz.

Parker, Richard A. A METHOD FOR REMOVING THE EFFECT OF RECRUITMENT ON PETERSEN-TYPE POPULATION ESTIMATES. J. Fish. Res. Bd. Can. 12(3): 447-450. May 1955. [From Sport Fish. Abs. 1(3).]

Author's abstract: "A regression analysis, which is based on time changes in the ratio of the number of marked fish in the daily catch, was used to estimate initial population size. This method eliminates overestimation caused by recruitment."

Waugh, W. A. O'N. (Roy. Military Coll. Sci., Shrivenham.) AN AGE-DEPENDENT BIRTH AND DEATH PROCESS. Biometrika 42(3/4): 291-306. Dec. 1955.
Deals with a mathematical model involving a continuous time parameter and an enumerable set of states.--V. Schultz.

Williams, E. J. (C.S.I.R.O., Melbourne, Australia.) SIGNIFICANCE TESTS FOR DISCRIMINANT FUNCTIONS AND LINEAR FUNCTIONAL RELATIONSHIPS. Biometrika 42(3/4): 360-381. Dec. 1955.
Of value to taxonomists and others interested in applying such functions to their problems.--V. Schultz.

WILDLIFE--TECHNIQUES

Miller, Loye. (MVZ, U. Calif., Berkeley.) THE AUXILIARY BARREL. Wilson Bul. 67(4): 297-301, 1 fig. Dec. 1955.
Many helpful suggestions on making these collecting aids, and notes on selecting and altering collecting pistols.

WILDLIFE--MANAGEMENT & RESEARCH, GENERAL

Bumgarner, Willis Clifton. GUIDEBOOK FOR WILDLIFE PROTECTORS / PREPARED FOR THE ENFORCEMENT OFFICERS OF NORTH CAROLINA WILDLIFE RESOURCES COMMISSION. U. of N. C., Inst. of Government, Guidebook Ser. 196 p. 1955. $2.00. [From Monthly Checklist of State Publ. 46(11).]

PROCEEDINGS OF THE SOUTHEASTERN ASSOCIATION OF GAME AND FISH COMMISSIONERS. NEW ORLEANS, LA., NOV. 1, 2, 1954. 1-131 p., illus. [Dec. 1955. $2.00, paper, from James W. Webb, Box 360, Columbia, S. C.]
Here, for the first time, the proceedings of a regional wildlife conference are published in letterpress on good paper. The SE. Assn. intends to continue publishing its conference proceedings. The present volume includes more material than might be thought from its 131 pages, for its large (8.5 x 11 in.) pages bear ? columns of relatively small print. The print is clear and easily read, however, Reported here are many of the papers presented at the 8th annual meeting. Panel discussions are summarized. Most of the game papers were covered in WR 79 through mimeographed copies; published texts seem to differ little and will not be entered in WR except for 2 for which mimeographed copies were not available.

PROCEEDINGS OF THE THIRTY-FIFTH ANNUAL CONFERENCE OF WESTERN ASSOCIATION OF STATE GAME AND FISH COMMISSIONERS, Moran, Wyoming, June 16-18, 1955. xviii + 317 p., mimeo., maps & graphs. 1955. $2.00 from Ben Glading, Calif. Dept. Fish & Game, 926 J St., Sacramento 14, Calif.
A paper-bound book, 8.5 x 11 x 1 inches in size, that contains 66 consecutively paged papers on fish and game problems. Many of the technical game papers are listed individually in this issue of WR. Topics to which groups of papers are devoted are: conflicts of interests in water developments, the future of game in relation to land-use planning, the proper role of state fish and game commissioners, the place of various organizations in research, deer damage problems, selling management programs to the public, importance and techniques of law enforcement.

Ryder, Ronald A. (Colo. Game Comm.) EIGHT YEAR HUNTER CHECK, SOUTH PLATTE MANAGEMENT AREA. Colo. Game & Fish Comm., Final Rep. Proj. no. W-37-R-8. 1-23 p., mimeo. July 1955.
History, description, and operation of tract; hunting statistics for waterfowl; general food habits of waterfowl as determined from gizzard contents; weights of waterfowl; hunting statistics for deer; weights and ages of deer; management recommendations.

WILDLIFE--MANAGEMENT & RESEARCH, GENERAL--Continued

Worcester, Hugh M. HUNTING THE LAWLESS. Am. Wildl. Associates (1229-B Univ. Ave., Berkeley, Calif.). 298 p., illus. 1955. $5.00. [From review in Outdoor News Bul. 10(3).]

"...Worcester relates his many experiences during 30 years as a game management agent for the U. S. Fish and Wildlife Service and as a law enforcement officer with the state game agencies of Idaho and Washington. Most of the author's work as a game management agent was in detecting and apprehending the various gangs of vicious hoodlums in California who were shooting tremendous numbers of ducks and geese for sale to restaurants. ...the author tells in full detail the widespread and sometimes perilous undercover work by which many [gangs] were broken up and jailed. Described also is undercover work in Mexico where the author had been sent to determine the validity of stories about large-scale illegal shooting on the part of the Mexicans. His work exploded this theory and pointed instead to the American hunters who went south of the border to shoot."

WILDLIFE--HUNTING AREAS & PROBLEMS

Dufresne, Frank, and Ted Trueblood. IS PUBLIC HUNTING DOOMED? Field & Stream 60(6): 40-41, 94-97, illus. Oct. 1955.

Public hunting is far from doomed in the far western states, for they have lots of public land. But this public land is hunted chiefly for big game. Hunting facilities for small game, which occurs mainly on private lands, are much more of a problem, and so are facilities for waterfowl hunting. The authors tell what is being done in the 11 western states to acquire game areas, to get hunters to permit hunting by permission, to improve hunter-farmer relationships, to manage land for game, to organize cooperative hunting areas, to get into operation councils that represent many conservation interests, etc. Ground is being gained in some states in the struggle to keep lands open to hunting, but it is still being lost in others.

Page, Warren, and Ray Camp. IS PUBLIC HUNTING DOOMED? PART III. Field & Stream 60(8): 52-54, 83-86, illus. Dec. 1955.

Survey of conditions in states from Va. through N. Y. and New England. Considers amount of state and federal land available for hunting, rates at which private lands are becoming posted, progress being made by game departments in providing public or leased land for hunting, increase of hunting preserves, etc.

Titus, Harold, and George Laycock. IS PUBLIC HUNTING DOOMED? Part II. Field & Stream 60(7): 82-84, 172-176, illus. Nov. 1955.

Free public hunting is becoming scarcer all the time. Here is what the situation is and what is being done about it in the 13 north-central states. Some states run shooting preserves stocked with pen-reared birds, others buy or lease lands for hunting, some are fortunate enough to have federal lands for hunting, some encourage private shooting preserves. Farmer-hunter cooperatives are just holding their own in Mich. but still spreading in Iowa. Mo. gets farmers, sportsmen, and state technicians in on project planning, with sportsmen doing the work in exchange for hunting privileges.

WILDLIFE--PREDATION, CROP DAMAGE, CONTROL

Davis, R. K. LARCENY IN THE HENHOUSE. Ohio Cons. Bul. 20(2): 12-13, 24-25, illus. Feb. 1956.

How to protect poultry from predation, how to recognize work of given predators, and how to catch or kill these predators.

Hibbard, Ed. (N. Dak. Game Dept.) HISTORY OF THE BOUNTY SYSTEM IN NORTH DAKOTA AND ITS EFFECT ON THE PREDATORY POPULATION. N. Dak. Outdoors 18(8): 10-13, illus. Feb. 1956.

Tells of the history of bounty payments in N. Dak. and provides table showing numbers of red foxes, coyotes, and bobcats bountied each year since 1943. Graph shows that coyotes have declined greatly since 1946 and are now relatively rare in N. Dak. This decline is attributed to US F&WS work with coyote getters and 1080. Meanwhile, number of bobcats bountied rose about 10 times; red foxes not only increased but extended their range in state. Rise of bobcats and foxes is attributed to reduction of coyotes. It is also evidence of inability of bounties to control these animals.

Nagel, W. O., Frank W. Sampson, and Allen Brohn. (Mo. Cons. Comm.) PREDATOR CONTROL--WHY AND HOW. Mo. Cons. Comm. 1-32 p., illus. 1955.

Part I is a good, popular, common-sense discussion of predation. The gist of it is that predation is to the advantage of man a good part of the time. When it is not, the only sensible course is to catch the troublesome individuals. Bounties have been used in Mo. for at least 130 years and it is clear they are an expensive failure. Real success in meeting damage complaints has been obtained with the extension trapper system. Part II is a practical, detailed, illustrated account of how to trap foxes and coyotes. It is complete with necessary information about habits and signs of the animals, proper sites for traps, equipment needed, and how to make recommended types of sets.

WILDLIFE--REPORTS OF ORGANIZATIONS & REPORTS OF HARVESTS

Alberta. ANNUAL REPORT OF THE DEPARTMENT OF LANDS AND FORESTS...FOR THE FISCAL YEAR ENDED MARCH 31ST 1955. 1-102 p., illus. 1955.

A successful cow-elk season was held in a local area of overpopulation. There was no open season for moose, deer or antelope. Pheasants thrived, but sharptailed grouse, ruffed grouse, and Hungarian partridge were at the bottom of a cyclic crash except in isolated areas. Migratory waterfowl increased. Additional beaver licensing increased the take. Rabies campaign success required less effort in this direction. Wolf bounty was discontinued. Pheasant and chukar partridge release figures are given. Also included are tables of numbers of various licenses, 1951-4, and numbers and values of pelts, 1954-5.--L. F. Stickel.

British Columbia. PROVINCIAL GAME COMMISSION REPORT FOR THE YEAR ENDED DECEMBER 31ST 1954. 1-102 p. 1955.

A useful and informative report that provides considerable information on game conditions in the districts, harvests of big game, browse studies, game bird breeding conditions, predator problems and control programs. It is interesting to note that chukar colonies are growing to harvestable level, that deer and moose require heavier shooting in certain areas, that civilization is making marked inroads on game habitat, that the coyote bounty was removed with little consequent protest, and that good control of wolves and coyotes has been obtained with 1080. Tables show, among other things, pelts (by species) on which royalty was collected, 1921-54; bounties paid (by species), 1922-54; and game birds liberated, 1954.

Idaho. TWENTY-FIFTH BIENNIAL REPORT OF THE FISH AND GAME DEPARTMENT...JULY 1, 1952 TO JUNE 30, 1954. 1-79 p., illus. 1955?

Sections on terrestrial animals and habitats include reports on range improvement studies, work accomplished on management areas, status and harvests of upland game birds, hunting conditions for waterfowl, and progress in habitat improvement for farm game. Tables provide figures on big-game harvests, pheasant sex ratios and hunting statistics, mid-winter waterfowl inventory (by species), production on game farms, predator control, and beaver pelts taken.

Maryland. THIRTY-EIGHTH ANNUAL REPORT OF THE DIRECTOR AND SEVENTEENTH ANNUAL REPORT OF THE GAME AND INLAND FISH COMMISSION 1955. Md. Cons. 32(6): 1-32 p., illus. Nov. 1955.

Management and research projects are described briefly and some of their results are mentioned. Tables show numbers of reared or transplanted birds and mammals released.

McKay, Douglas. 1955 ANNUAL REPORT / SECRETARY OF THE INTERIOR / FOR THE FISCAL YEAR ENDED JUNE 30. Govt. Printing Office, D. C. xlv + 406 p., illus. [1956.] $1.25 from Supt. Documents.

Reports of all bureaus of the department. Cooperation with states is emphasized. Fish & Wildlife Service, p. 297-329: economic aspects; wildlife research, including chemical repellent and control studies involving both plants and animals, waterfowl, fur animal, and disease studies; refuge management and establishment during the year; federal aid program; river basins; damage control; international cooperation in conservation.--L. F. Stickel.

Missouri. ANNUAL REPORT OF THE...CONSERVATION COMMISSION / FISCAL YEAR JULY 1, 1954 TO JUNE 30, 1955. 1-66 p., graphs. 1956?

Includes: accounting of work on management areas and work done in habitat improvement, brief sketches of research projects, informative summary of game conditions, data on deer harvests, 1944-54, and data on fur harvests, by species, 1952-55.

Rhode Island. DEPARTMENT OF AGRICULTURE & CONSERVATION / NINETEENTH ANNUAL REPORT--1954. 1-117 p., illus. 1955?

Report of Division of Fish and Game (p. 91-108) gives general picture of game research and management program. Tables report fur catch, by species, 1949-54; and game kill, 1948-53, by species or group ("waterfowl"). Fox bounties paid indicate increase in fox population. Snowshoe hare hunting is becoming more popular and these hares will be stocked.

Virginia. ANNUAL REPORT OF THE COMMISSION OF GAME AND INLAND FISHERIES FOR THE FISCAL YEAR ENDING JUNE 30, 1953. 1-65 p., illus. 1954?

Report of the game division provides a fair amount of information on progress of management and research projects. Tables show kill of bear and deer w. of Blue Ridge, 1945-53.

WETLANDS & WILDLIFE

Allan, Philip F., and Wallace L. Anderson. (251 Culver Rd., Rt. 5, Ithaca, N. Y.) MORE WILDLIFE FROM OUR MARSHES AND WETLANDS. US Dept. Agr., Ybk. Agr. 1955. p. 589-596. 1955.

Points out that the economic value of marshes for waterfowl and fur animals, though already considerable, can be increased by management, particularly by controlling water supplies and, under many circumstances, by burning. Discusses some of the more important marsh plants and their management both for muskrat production and waterfowl use. Much of the article consists of detailed management recommendations for given species and circumstances and hence is of interest to anyone concerned with marsh management.--A. C. Martin.

Benson, Robert I. (Minn. Dept. Cons., Glenwood.) A STUDY OF POTHOLES AND THEIR UTILIZATION BY WILDLIFE IN POPE COUNTY, MINNESOTA. Minn. Nat. 6(3): 47-50, illus. Sept. 1955.

Fifteen potholes totaling 55 acres were studied 1950-52. They are described and their use by waterfowl, pheasants, other birds, and muskrats is discussed briefly. Waterfowl production was disappointing; only 6 of the potholes were known to have had nests and none had more than 2 per year. Benson feels sure that the potholes were being used well below capacity by waterfowl and suspects that a later opening of duck season might increase the breeding population. In other words, a burn-out by shooting is implied. "Values of the potholes to upland game was reduced to practically zero after blizzards had filled in the vegetation with snow. Potholes under ten acres in size are too small to furnish cover throughout a normal winter. Many nongame birds used potholes for food, shelter, and nesting." Muskrat houses varied from 20 in 1950 to 105 in 1952. Few potholes had no muskrats.

Greenwald, Margaret. LIST OF REFERENCES ON CONTROL OF AQUATIC PLANTS, INCLUDING ALGAE. Chipman Chem. Co., Bound Brook, N. J. 1-22 p. Jan. 1956.

A valuable list of some 700 references from many journals and other sources. Many of the sources are not familiar to biologists. Certain of the references cited were so informally issued that their existence would scarcely be known if it were not for this list.

Nelson, Noland F. (Utah Dept. Game.) ECOLOGY OF GREAT SALT LAKE MARSHES. Proc. Utah Acad. Sci. 32: 37-40. 1955.

Good, brief survey of factors and successions.

Schrader, Thomas A. (US F&WS, Minneapolis 8, Minn.) WATERFOWL AND THE POTHOLES OF THE NORTH CENTRAL STATES. US Dept. Agr., Ybk. Agr. 1955. p. 596-604, 2 figs. 1955.

Extent of drainage and its importance to waterfowl, numbers and types of potholes, importance of different types of potholes to waterfowl, ways of saving potholes. There are 3 general ways of saving these wetlands: 1. Lease or purchase by public agencies for wildlife breeding and hunting. This is good but cannot be inclusive enough by itself. 2. Encourage private, multiple use of potholes for cropping in dry periods, or for growing moist-soil forage plants, as water supply for farm needs, for production of fur, minnows, and wild ducks. Returns from such alternative uses might exceed the net income a farmer would get after drainage. 3. In zones of poor, hilly land, crop farming should yield to growing of grass and cover crops. This could result in less drainage and higher economic level for landowners.

Shaw, Samuel P., and Walter F. Crissey. (US F&WS, Wash., D. C.) WETLANDS AND THE MANAGEMENT OF WATERFOWL. US Dept. Agr., Ybk. Agr. 1955. p. 604-614, 3 figs. 1955.

A general paper that tells about the Wetlands Survey and gives some of its figures, discusses habitat needs of waterfowl and conflicts between waterfowl and agriculture, and considers what should be done to preserve waterfowl habitat.

Wilson, Kenneth A. (N. C. Wildl. Resources Comm.) EXPERIMENTAL MARSH MANAGEMENT NEAR CURRITUCK, NORTH CAROLINA. N. C. Wildl. Resources Comm., Job Completion Rep., Fed. Aid Project W-6-R. 1-25 p., 2 maps, proc. Sept. 1955.

Few marsh management studies anywhere in the U. S. have yielded more useful and varied information than have the investigations at Currituck. Though the work relates directly to improvement of marshes for muskrats, the findings also have significance for management of waterfowl habitat. The report deals with experiments on control of pest plants and propagation of useful species during the period 1949-1954. In particular, it indicates results of control tests on needlerush, sawgrass, and cordgrass by burning, disking, spraying, mowing, and scalping, and success or failure of propagative trials with cattails and threesquares.--A. C. Martin.

Wood, Roy. (US F&WS.) WATER, WETLANDS, AND WILDLIFE OR PLANNING FOR WETLAND PRESERVATION AND DEVELOPMENT IN THE SOUTHEASTERN UNITED STATES. Proc. SE. Assn. Game & Fish Comms., New Orleans, La., Nov. 1, 2, 1954. p. 122-129. [Dec. 1955.]

This long paper, based in part on the Wetland Survey, discusses factors and situations that are decreasing wetlands in the SE. and those that are increasing or improving them. It outlines types of cooperative actions that will be needed to maintain the wetlands and keep them productive.

RANGELAND & WILDLIFE

Biswell, H. H. (U. Calif., Berkeley.) ECOLOGY OF CALIFORNIA GRASSLANDS. J. Range Mgt. 9(1): 19-24, illus. Jan. 1956.

An informative summary of the subject.

Glendening, G. E., and H. A. Paulsen. REPRODUCTION AND ESTABLISHMENT OF VELVET MESQUITE AS RELATED TO INVASION OF SEMIDESERT GRASSLANDS. USDA Tech. Bul. no. 1127. 50 p., illus. Oct. 1955. 25¢ from Supt. Documents. [From J. Forestry 54(2).]

Schultz, Arnold M. (U. Calif., Berkeley.) THE USE OF REGRESSION IN RANGE RESEARCH. J. Range Mgt. 9(1): 41-46, graphs. Jan. 1956.

Good explanation of use of regression line statistics in studying range problems of economic importance.

FORESTLAND--FORESTRY & ECOLOGY

Morrow, R. R. THE CASE AGAINST WOODLOT GRAZING. U. of N. Y. Coll Agr., (Ithaca) Cornell Ext. Bul. no 939. 4 p., illus. 1955. [From J. For. 53(12).]

FORESTLAND--MANAGEMENT FOR & DAMAGE BY WILDLIFE

Barick, Frank B. (N. C. Wildl. Resources Comm) WOODSMAN: SPARE THAT HARDWOOD. Wildl. in N. C. 20(2): 14-15, illus. Feb. 1956.

"Organized wildlife interests as well as commercial forest interests would do well to call for a careful re-appraisal of the forestry situation in North Carolina with the following objectives: 1. To more closely adapt forest practices to land-species capabilities. 2. To prevent converting to pine areas which would produce crops of hardwood of equal or greater commercial value. 3. To develop a better understanding of the principles of hardwood forestry, especially of mast and browse producing species which are of value to wildlife."

Bulfer, Dan E. (US For. Serv.) THE WISCONSIN COOPERATIVE FOREST WILDLIFE PROGRAM: THE FORESTER'S VIEWPOINT. Proc. Soc. Am. For. Meeting. p. 138-141. 1954.

The Wis. Cons. Dept. and the Forest Service are working to improve wildlife management on 1,460,000 acres of national forest land. A management plan has been prepared jointly. The forester gives whatever consideration to wildlife his circumstances permit. The state reimburses the Forest Service for special services such as disking, planting, and browse cutting. The game manager seeds clover on abandoned logging roads and makes small waterfowl impoundments, using PR funds. Cooperation is developed by working together. Wildlife is considered the exclusive use in some of the areas. Other areas have special wildlife values which are zoned as such but are fully compatible with other uses. A beginning has been made in inventorying and classifying critical wildlife areas. Ultimate success of the program depends on finding some solution to inadequate harvesting of deer. The Forest Service is considering deferring hardwood cuttings in some areas until deer are reduced to a point where forest reproduction can get through.--H. W. Steinhoff.

Keener, John M. (Wis. Cons. Dept.) THE WISCONSIN COOPERATIVE FOREST WILDLIFE PROGRAM: THE WILDLIFE MANAGER'S VIEWPOINT. Proc. Soc. Am. For. Meeting. p. 141-143. 1954.

In Wis., 4,000,000 acres, 10% of the land area, are public land open to hunting. Sales of deer hunting licenses have increased 400% in 20 years. Habitat manipulation is the most successful way of satisfying this increased hunting pressure. Crops of timber and game can be produced without appreciable loss to either. Better markets for forest products and changes in forest operations have resulted in forest practices compatible with increased game production without loss in timber values. Problems include limited winter deer range, large acreages of young even-aged hardwoods, and best management of openings. Wis. has invested $60,000 of PR funds in game habitat improvement in public forests. Projects include 2400 acres of browse improvement cuttings, 1300 acres disked to increase production of sprouts and seedlings, 300 miles of trails seeded to legumes and grass, and access road opened. Impoundments for waterfowl and furbearers are planned; deer feeding stations have been reduced. Future cooperation may bring about forest plantations in smaller blocks, special timber cuttings near deer yards, diversion from maximum timber production to increase wildlife production on some areas, and providing access for loggers to remote areas.--H. W. Steinhoff.

Krajicek, John E. (US For. Serv., Iowa St. Coll.) RODENTS INFLUENCE RED OAK REGENERATION. US For. Serv., Cent. St. For. Exp. Sta., Station Note no. 91, 2 p. Dec. 1955.

Unprotected acorns planted beneath leaves in experimental plots were nearly all destroyed by rodents. Planted in soil, destruction was 68%. Protection removed after germination resulted in 55%-95% destruction. Insects reduced survival to 5.6%. In other areas, oak seedlings developed in litter-free areas from acorns apparently buried by rodents.—L. F. Stickel.

Wagar, J. V. K. (Colo. A & M Coll.) QUALITY STANDARDS FOR FOREST RECREATION AND WILDLIFE PRODUCTION AND HARVEST. Proc. Soc. Am. For. Meeting. p. 128-132. 1954.

The only recognized standard of values for wildlife and recreation is success, or lack of it. This is purely quantitative. We need specific quality standards that are simply diagrammed, easily remembered, and dramatic in contrasts. The pattern long used for lumber grading seems useful, i.e., select and fancy grades (top) down to No. 5 common (bottom). For fishing quality this would be: An

undescribed fish in an unnamed, unmapped lake or stream (top) down to a commercial fishpond (bottom). For hunting quality it would be: The giant panda hunt by Theodore Roosevelt's sons (top) down to Life's bear hunt in New Mexico (bottom). For Aldo Leopold's origin-quality concept it would be: The grizzly bear (top) down to artificially bred, oversize, succulent deer and pheasants (bottom). Recreation standards are presented for understanding, contribution, and restraint by the individual. All seem easily recognized and permit ranking of wildlife and recreational quality by anyone. The standards described clarify issues raised as to what quality really is.--H. W. Steinhoff.

STRIPPED LAND & MISCELLANEOUS HABITATS

Leisman, Gilbert Arthur. A VEGETATION AND SOIL CHRONOSEQUENCE ON THE MESABI IRON RANGE SPOIL BANKS, MINNESOTA. Ph.D. thesis, U. Minn. 134 p. 1955. [From long abstract in Dissertation Abstracts 15(11).]

CONTROL OF UPLAND VEGETATION WITH HERBICIDES ETC.

Blaisdell, James P., and Walter F. Mueggler. (For. & Range Exp. Sta., Ogden, Utah.) EFFECT OF 2,4-D ON FORBS AND SHRUBS ASSOCIATED WITH BIG SAGEBRUSH. J. Range Mgt. 9(1): 38-40. Jan. 1956.

Bramble, W. C., and W. R. Byrnes. (Pa. State U.) EFFECT OF CERTAIN COMMON BRUSH CONTROL TECHNIQUES AND MATERIALS ON GAME FOOD AND COVER ON A POWER LINE RIGHT-OF-WAY NO. 2. Pa. State U., Agr. Exp. Sta., Prog. Rep. no. 135. 1-7 p., illus. Aug. 1955.

This is a second progress report on a study begun in 1951 involving tests on 5 different herbicidal methods of controlling woody regrowth along a power-line right-of-way in an oak-hickory forest of central Pa. Present indications seem to confirm basal spraying as not only effective in preventing regrowth of tree sprouts but also in promoting a low, dense cover of shrubs and herbs. Signs of wildlife use have been noted in various study areas along the right-of-way and apparently the greatest utilization has been in the untreated unit where sprouts have grown as high as 8 feet. It is recognized, however, that it is too early in the study for conclusions on this aspect.--A. C. Martin.

Hyder, Donald N., and Forrest A. Sneva. (Squaw Butte-Harney Exp. Sta., Burns, Ore.) HERBAGE RESPONSE TO SAGEBRUSH SPRAYING. J. Range Mgt. 9(1): 34-38, illus. Jan. 1956.

Jokela, J. J., and Ralph W. Lorenz. (Agr. Exp. Sta., Urbana, Ill.) A COMPARISON OF THREE METHODS OF ELIMINATING CULL TREES FROM WOODLANDS WITH 2,4,5-T. J. For. 53(12): 901-904, illus. Dec. 1955.

The 3 methods compared as to cost and effectiveness are basal spray, ax frill and spray, and Cornell tool.

Prescott, Lionel Howell. THE CONTROL OF WEEDS AND BRUSH IN LOUISIANA PASTURES WITH HERBICIDES. Ph.D. thesis, La. State U., 102 p. 1955. [From long abstract in Dissertation Abstracts 15(11)].

Various formulations of herbicides in different solvents were tested for effect on trees, brush and miscellaneous weeds. Principal herbicides used were 2,4-D and 2,4,5-T. Principal species of plants treated were chickasaw rose (Rosa bracteata), palmetto (Sabal minor) and dock (Rumex crispus).--L. F. Stickel.

Schubert, Gilbert H. RECENT TRIALS WITH 2,4-D and 2,4,5-T TO KILL BRUSH IN THE SIERRA NEVADA IN CALIFORNIA. US For. Serv., Calif. For. & Range Exp. Sta., For. Res. Notes no. 102. 1-7 p., proc. Dec. 1955.

MAMMALS--GENERAL

Hamilton, W. J., Jr. (Cornell U.) MAMMALOGY IN NORTH AMERICA. In "A Century of Progress in the Natural Sciences 1853-1953," Calif. Acad. Sci. p. 661-688, illus. 1955.

This readable history of study of mammals in N. Am. sketches not only growth of knowledge but growth of institutions and the rise of conservation. Leaders in the field are mentioned and portraits of several are included.

Holling, C. S. (For. Insect Lab., Sault Ste. Marie, Ont.) THE SELECTION BY CERTAIN SMALL MAMMALS OF DEAD, PARASITIZED, AND HEALTHY PREPUPAE OF THE EUROPEAN PINE SAWFLY, NEODIPRION SERTIFER (GEOFF.). Can. J. Zool. 33(6): 404-419, 6 figs. Dec. 1955.

From abstract: Caged Sorex, Blarina, and Peromyscus opened more cocoons containing healthy prepupae than ones containing prepupae attacked by fungus. "In the field and in the laboratory, S. c. cinereus opened more healthy cocoons than cocoons containing parasites. The reverse appeared to be true for B. b. talpoides. P. m. bairdii opened equal numbers of healthy and parasitized cocoons. The more insectivorous animals exhibited the greatest selective ability. Pretreatment to cocoons of one category affected the selective ability. Pretreating P. m. bairdii to fungus cocoons lowered the ability to select healthy cocoons... Pretreating animals to healthy cocoons raised the selective ability. Selection occurred in the digging, removing, opening, and eating phases in the search for cocoons. The closer the phase to the consummatory action, the greater was the degree of selection. The selective ability in the first three phases was acquired with experience. In the final, eating, phase it was innate."

Matthews, L. H. THE HIBERNATION OF ANIMALS. Discovery 15: 437-442. 1954. [From J. Anim. Ecol. 24(2).]

"A review of the phenomenon in dormice and hedgehogs with reference to cyclic changes in glandular activity."

Matthews, L. H. THE MIGRATION OF MAMMALS. Discovery 15: 202-206. 1954. [From J. Anim. Ecol. 24(2).]

"An account of migration with especial reference to lemmings and bats."

Mossman, Archie S. (U. Wis.) LIGHT PENETRATION IN RELATION TO SMALL MAMMAL ABUNDANCE. J. Mamm. 36(4): 564-566, 1 fig. Nov. 1955.

Small mammal abundance in grass habitats, as shown by use of "dropping boards," increased with density of cover (indicated by light penetration). Light measurements were made with a photo-electric meter.--L. F. Stickel.

Schneirla, T. C. PSYCHOLOGICAL PROBLEMS IN THE ORIENTATION OF MAMMALS. Proc. of a Conf. on Orientation in Animals. Office Naval Res. (Wash., D. C.). p. 193-207. 1954. [From J. Mamm. 36(4).]

MAMMALS--FAUNAS AND MANUALS

Durrant, Stephen D., M. Raymond Lee, and Richard M. Hansen. (U. Utah.) ADDITIONAL RECORDS AND EXTENSIONS OF KNOWN RANGES OF MAMMALS FROM UTAH. U. Kans. Publ., Mus. Nat. Hist., 9(2): 69-80. Dec. 1955.

Constitutes a supplement to Durrant's "Mammals of Utah," and is based on some 5,000 specimens not available when the book was written. Contains distributional or taxonomic data on many species.

Hall, E. Raymond. (U. Kans.) HANDBOOK OF MAMMALS OF KANSAS. U. Kans. Mus. Nat. Hist., Misc. Publ. no. 7. 1-303 p., illus. Dec. 1955. $1.50, paper; $2.00, cloth.

A good, semitechnical handbook with many useful features. Cockrum's "Mammals of Kansas" is now scarce and is too technical to be wholly suited to lay use. Hall's "Handbook" is designed for use by anyone who is interested enough to study the fine, illustrated glossary. Keys simplify identification of species, as do the excellent maps and skull drawings. Black and white sketches suggest the general aspect of each species. The necessary but unavoidably dull descriptions of species are kept brief. Subspecies in the state are listed

and their ranges are mapped, but otherwise subspecies are quite properly de-emphasized. Species accounts run from one to several paragraphs and tend to be anecdotal rather than encyclopedic; they do, however, include the basic biological data for most species for which these facts are known. One suspects, in glancing over the species accounts, that Hall purposely has varied subject matter and line of approach from species to species to avoid monotony--a practice that seems highly desirable in popular handbooks. The back of the book contains a long section on methods of collecting and preparing specimens of mammals, amphibians, reptiles, and fishes. Of this long section, less than a page pertains to study of life history and ecology. Other criticisms that may be ventured are: (1) The few really difficult identifications deserve more attention than they receive. (2) Some of the most useful or best illustrated mammalogy books (Nelson, Cahalane, and Hamilton, for example) should have been mentioned for further reading.

MAMMALS--POPULATIONS, HOME RANGES, COMMUNITIES

Steven, D. M. (U. Edinburgh, Scotland.) SMALL MAMMAL COMMUNITIES OF THE NORTH SCANDINAVIAN BIRCH FOREST. J. Anim. Ecol. 24(2): 403-411, 1 fig. Nov. 1955.

Habitat distribution and catch rate of 6 sp. presented also as weekly catch and 24 hr. vs. full period catch. Based on removal trapping, mostly in 20 m. blocks of 25 traps.--L. F. Stickel.

MAMMALS--PARASITES AND DISEASES

Ballantyne, E. E. (Alta. Dept. Agr.) RABIES CONTROL PROGRAMME IN ALBERTA. Can. J. Comp. Med. & Vet. Sci. 20(1): 21-30, illus. Jan. 1956.

Describes control measures and their results, tells of wildlife depopulation work, and includes table showing numbers of various species of mammals that proved positive for rabies.

Davis, Chester S. ONE COUNTY'S TOLL / THE ALLEGHANY RABIES EPIDEMIC. PART II. Wildl. in N. C. 19(12): 6-8, illus. Dec. 1955.

This county in nw. N. C. has lost some $25,000 worth of livestock to rabies in the last few years and many people have had to take anti-rabies shots. Vaccination of 80-90% of dogs has kept rabies rare in dogs. The disease is primarily in foxes, which were at a high level and were protected by law during most of year. Now foxes are being thinned out by trapping. The epizootic took 2 years to cross the county and is now spreading to adjacent counties. It could be stopped, but there is resistance from people who do not believe in rabies, those who won't permit their dogs to be vaccinated, and from outraged fox hunters.

Hallberg, Carl W. (Bowling Green State U.) DIOCTOPHYMA RENALE (GOEZE, 1782) A STUDY OF THE MIGRATION ROUTES TO THE KIDNEYS OF MAMMALS AND RESULTANT PATHOLOGY. Trans. Am. Micros. Soc. 72(4): 351-363, 6 figs. Oct. 1953.

Voge, Marietta. (U. Calif., Los Angeles.) A LIST OF CESTODE PARASITES FROM CALIFORNIA MAMMALS. Am. Midl. Nat. 54(2): 413-417. Oct. 1955.

SHREWS, MOLES, BATS

Burns, Kenneth F., Charles J. Farinacci, and Thomas G. Murnane. (Ft. Sam Houston, Texas.) RABIES IN INSECTIVOROUS BATS OF TEXAS. J. Am. Vet. Med. Assn. 128(1): 27-31. Jan. 1956.

Nine strains of rabies were isolated from brains of Tadarida mexicana in Texas in 1954. Neutralizing antibody was found in a large percentage of specimens. It now seems that insectivorous bats may serve as an important reservoir for sylvatic rabies in Texas. (Forty Myotis velifer, however, were negative for rabies.)

SHREWS, MOLES, BATS--Continued

Burns, Kenneth F., and Charles J. Farinacci. (Med. Center, Ft. Sam Houston, Texas.) VIRUS OF BATS ANTIGENICALLY RELATED TO ST. LOUIS ENCEPHALITIS. Sci. 123(3189): 227. Feb. 10, 1956.
Hundreds of bats died in a colony. Rabies virus was isolated, as was an undetermined virus somewhat similar to that of St. Louis encephalitis.

Findley, James S. SPECIATION OF THE WANDERING SHREW. U. Kans. Publ., Mus. Nat. Hist., 9(1): 1-68, 18 figs. Dec. 1955.
Taxonomy, relationships, and probable distributional and evolutionary history of the vagrans-obscurus group. Twenty-nine subspecies of vagrans are recognized. Also discussion of subgenera of Sorex. More informative abstract in WR 83: 21.

Griffin, Donald. (Harvard U.) PROBLEMS CONCERNING ACOUSTIC ORIENTATION IN BATS. Proc. of a Conf. on Orientation in Animals. Office Naval Res. (Wash., D. C.). p. 139-148. 1954. [From J. Mamm. 36(4).]

Rudd, Robert L. (U. Calif., Davis.) POPULATION VARIATION AND HYBRIDIZATION IN SOME CALIFORNIAN SHREWS. Syst. Zool. 4(1): 21-34. Mar. 1955. [From J. Mamm. 36(4).]

Voge, Marietta, and Robert Rausch. (U. Calif. Sch. Med., Los Angeles.) OCCURRENCE AND DISTRIBUTION OF HYMENOLEPIDID CESTODES IN SHREWS. J. Parasit. 41(6): 566-573. Dec. 1955.

RABBITS AND PIKAS

Bednarik, Karl. (Ohio Div. Wildl.) SAN JUAN RABBITS: FURRED MENACE? Ohio Cons. Bul. 19(12): 8-9, 30-32, illus. Dec. 1955.
Review of evidence as to why Oryctolagus should not be released in U. S. It is reported that captive San Juan rabbits in Ohio have done extensive burrowing, so it is clear that this trait has not been lost in the San Juan stock.

Hewson, R. THE MOUNTAIN HARE IN SCOTLAND IN 1951. Scot. Nat. 66: 70-88. 1954. [From J. Anim. Ecol. 24(2).]
"The results of a survey, mainly by questionnaire to gamekeepers. In 1951 Lepus timidus was increasing in most parts of Scotland, and commonest in the eastern Highlands. On eight estates where figures for both species were available the major peaks in hares roughly coincided with those for red grouse."

Hildreth, A. C., and G. B. Brown. (USDA.) REPELLENTS TO PROTECT TREES AND SHRUBS FROM DAMAGE BY RABBITS. USDA Tech. Bul. no. 1134. ii + 31 p., illus. Dec. 1955. 15¢ from Supt. Documents.
Result of 22 years of work by USDA and others. History of the search for repellents is detailed and experiments are described. Any toxicity of materials to plants is noted. "Four materials were found, however, that met most of the requirements of a satisfactory repellent--nicotine, nicotine sulfate, tetramethylthiuram disulfide, and tetraethylthiuram monosulfide. The first three materials are available in commercial insecticides or fungicides. Tetraethylthiuram monosulfide is not yet in commercial production. Water emulsions of asphalt or of certain synthetic plastics proved to be suitable vehicles for any of these repellents. Formulas for making repellent mixtures are given. The present cost of the ingredients makes it practical to protect plantings with one of these preparations, and the ease of compounding from readily available commercial materials makes it feasible for a tree grower to prepare his own repellent."

Oderkirk, Galen C. (US F&WS, Purdue U.) DO REPELLENTS STOP ANIMAL DAMAGE? Pest Control 23(12): 9-10, illus. Dec. 1955.
Repellents can be used in a variety of situations and we should give more thought to using them. Two rabbit repellents are recommended. One, trinitrobenzene-aniline complex, is marketed as Ringwood Repellent. The other, zinc dimethyldithio-carbamate-cyclohexylamine complex, is sold as Goodrite z.i.p. and No Nib'l. Both chemicals are essentially taste repellents.

RABBITS AND PIKAS--Continued

Reynolds, J. K. (Div. Fish & Wildl., Maple, Ont.) DISTRIBUTION AND POPULATIONS OF THE EUROPEAN HARE IN SOUTHERN ONTARIO. Can. Field-Nat. 69(1): 14-20, 2 maps. Jan.-Mar. [Dec.] 1955.

History of spread since introduction in 1912. Map of present distribution and abundance. Range in Ont. is n. to middle of Georgian Bay and start of St. Lawrence River. The hares became really abundant by 1928, declined in the early 1940's, became abundant again by 1947-8, and continued to be abundant through 1953-4. Where abundant, there may be 25 hares per sq. mi. The author considers the hare a beneficial addition to the fauna of s. Ont.--L. F. Stickel.

Rowan, William B. (Okla. A & M Coll.) THE LIFE CYCLE AND EPIZOOTIOLOGY OF THE RABBIT TREMATODE, HASSTILESIA TRICOLOR (STILES AND HASSALL, 1894) HALL, 1916 (TREMATODA: BRACHYLAEMIDAE). Trans. Am. Micros. Soc. 74(1): 1-21, 24 figs. Jan. 1955.

Wight, Howard M. (Mo. Cons. Comm.) KEEPING TABS ON RABBITS. Mo. Cons. 17 (2): 1-3, illus. Feb. 1956.

Discusses and graphs ups and downs of cottontails in Mo., 1947-55, and tells about the various indexes of abundance that are used and what some of the factors are that affect the indexes.

RODENTS--MISCELLANEOUS

Barbehenn, Kile R. (7114 Sellers Ave., Upper Darby, Pa.) A FIELD STUDY OF GROWTH IN MICROTUS PENNSYLVANICUS. J. Mamm. 36(4): 533-543. Nov. 1955.

Growth of individual mice was studied by live trapping in two habitats. Additional weight data were obtained by snap traps. Variations in growth rate and weights occurred between habitats and seasons, but the author states, "Differential growth and size of individuals is not readily attributed to soils, weather or forage composition."--L. F. Stickel.

Cook, Edwin F., and James R. Beer. THE LOUSE POPULATIONS OF SOME CRICETID RODENTS. Parasit. 45(3/4): 409-420, 4 graphs. Nov. 1955.

Quantitative, biological studies of lice of Peromyscus maniculatus, Microtus pennsylvanicus, and Clethrionomys gapperi in Minn.

Dawson, William R. (Tex. A & M Coll.) THE RELATION OF OXYGEN CONSUMPTION TO TEMPERATURE IN DESERT RODENTS. J. Mamm. 36(4): 543-553, 2 figs. Nov. 1955.

Hall, J. E., B. Sonnenberg, and J. R. Hodes. (Med. Lab., Ft. Meade, Md.) SOME HELMINTH PARASITES OF RODENTS FROM LOCALITIES IN MARYLAND AND KENTUCKY. J. Parasit. 41(6): 640-641. Dec. 1955.

Hawbecker, Albert C. (Fresno State Coll.) OCCURRENCE OF PEROMYSCUS. J. Mamm. 36(4): 569-571, 1 fig. Nov. 1955.

List of small mammal species at a locality near lower Graveyard Lake, Sierra Natl. For., Calif. Travels of Peromyscus maniculatus individuals in 8 nights of live trapping.--L. F. Stickel.

Hoffmann, Robert S. (U. Mont.) A POPULATION-HIGH FOR PEROMYSCUS MANICULATUS. J. Mamm. 36(4): 571-572. Nov. 1955.

A very dense population was encountered in June 1954 in White Mts. of Mono Co., Calif. Mice were caught in nearly equal numbers in several different habitats, not just the normal sagebrush. Thirty per cent of the individuals were adult; more ♀♀ than ♂♂ were caught. Populations of other small mammals were relatively low. A table compares size of catch, and age and sex ratios with those from trapping done in the same area in 1917 at a time of medium low population.--L. F. Stickel.

RODENTS--MISCELLANEOUS--Continued

Hoyte, H. M. D. (U. Cambridge, Eng.) OBSERVATIONS ON REPRODUCTION IN SOME SMALL MAMMALS OF ARCTIC NORWAY. J. Anim. Ecol. 24(2): 412-425. Nov. 1955.
Sorex, Clethrionomys, Microtus. Breeding season is shorter, adults are smaller, more juveniles reach precocious maturity, and there is a tendency toward larger litters in arctic Norway than farther south. The estrus cycle (6-11 days) of Microtus oeconomus is described from examination of vaginal smears.--L. F. Stickel.

Miller, Richard S. (Harvard U.) ACTIVITY RHYTHMS IN THE WOOD MOUSE, APODEMUS SYLVATICUS AND THE BANK VOLE, CLETHRIONOMYS GLAREOLUS. Proc. Zool. Soc. London 125(3/4): 505-519, 5 figs. Nov. 1955.
Laboratory study of activity patterns under day lengths of 8, 12, and 16 hours. Results are described and discussed. "It is suggested that the role of activity rhythms in the community relations of the wood mouse and bank vole is an extremely critical one and that it is an important feature of any competition between them."

RATTUS AND MUS

Calhoun, John B. (Natl. Inst. Mental Health, Bethesda, Md.) A COMPARATIVE STUDY OF THE SOCIAL BEHAVIOR OF TWO INBRED STRAINS OF HOUSE MICE. Ecol. Monog. 26(1): 81-103, 5 figs. Jan. 1956.
Artificial colonies of each strain were established indoors in standard enclosures that provided sufficient food and shelter. Food for each colony was provided at a single hopper. Social behavior of mice was studied by observation and by examination of nest boxes. The strains showed pronounced differences. Members of 1 strain (already known to be physiologically unstable) fought more frequently and intensely, formed smaller and more dispersed groups, had lower reproductive success, and began dying more rapidly at high densities. The physiologically more stable strain was more adaptable in all social adjustments observed. Data that form the basis for the general conclusions and theory are presented in interesting detail and with consideration of statistical significance.--L. F. Stickel.

Conaway, Clinton H. (U. Mo.) EMBRYO RESORPTION AND PLACENTAL SCAR FORMATION IN THE RAT. J. Mamm. 36(4): 516-532, 2 plates. Nov. 1955.
Resorption was artificially induced; resulting scars were indistinguishable from scars formed after birth of young. When all embryos were resorbed at the same time, a greater embryo age was required for scar formation than when only part of the embryos were resorbed (11 vs. 7 days).--L. F. Stickel.

Krog, H., M. Monson, and L. Irving. (Irving: Arctic Health Res. Center, Anchorage, Alaska.) INFLUENCE OF COLD UPON THE METABOLISM AND BODY TEMPERATURE OF WILD RATS, ALBINO RATS AND ALBINO RATS CONDITIONED TO COLD. J. Applied Physiol. 7(4): 349-354. Jan. 1955. [From J. Mamm. 36(4).]

Serafiński, Wlodzimierz. THE SENESCENCE OF THE BROWN RAT (RATTUS NORVEGICUS BERK.) IN THE LIGHT OF CRANIOMETRY. Acta Theriologica, Inst. Zool. Polska Akad. Nauk (Warsaw) 1(1): 1-14. Jan. 1955. [From J. Mamm. 36(4).]
In Polish, with English summary.

Smith, William W. (US Pub. Health Serv., Newton, Ga.) THE ABUNDANCE AND DISTRIBUTION OF THE ECTOPARASITES OF THE HOUSE MOUSE IN MISSISSIPPI. J. Parasit. 41(1): 58-62, map. Feb. 1955.

Smith, William W. (US Pub. Health Serv., Newton, Ga.) RELATION OF CERTAIN ENVIRONMENTAL FACTORS TO THE ABUNDANCE AND DISTRIBUTION OF HOUSE MOUSE ECTOPARASITES IN MISSISSIPPI. Trans. Am. Micros. Soc. 74(2): 170-175, map. Apr. 1955.

SCIURIDS

Flyger, Vagn Folkmann. (Chesapeake Biol. Lab., Solomons, Md.) THE SOCIAL BEHAVIOR AND POPULATIONS OF THE GRAY SQUIRREL (SCIURUS CAROLINENSIS GMELIN) IN MARYLAND. D. Sc. thesis, Johns Hopkins U. 97 p., illus. Nov. 1955.

Herman, Carlton M., and Donald L. Price. (Patuxent Refuge, Laurel, Md.) THE OCCURRENCE OF HEPATOZOON IN THE GRAY SQUIRREL (SCIURUS CAROLINENSIS). J. Protozool. 2(2): 48-51, 2 figs. May 1955.
Summary: "Hepatozoon sciuri (Coles, 1914) is reported from...Washington, D. C. and Maryland. Blood smears...revealed a parasitemia in 16 to 71% of the squirrels examined. A technique for laking the red cells and concentrating the white cells in blood samples demonstrated this protozoon to be present in every squirrel so tested."

Hewson, R. THE RED SQUIRREL--SCIURUS VULGARIS LEUCOURUS KERR IN EASTER ROSS. Northw. Nat. (N.S.) 1: 493-496. 1953. [From J. Anim. Ecol. 24(2).]
"There was a great expansion of numbers from 1850 to 1900, and there has been an equally striking decline since then, especially since 1933. Neither destruction by man nor felling of woodlands seems to have been responsible; there is considerable similarity between the curves for squirrels killed and for mountain hares (Lepus timidus) killed during the period 1900-40."

Kirkpatrick, Charles M. (Purdue U.) THE TESTIS OF THE FOX SQUIRREL IN RELATION TO AGE AND SEASONS. Am. J. Anat. 97(2): 229-255, 5 plates. Sept. 1955.
From summary: "For each of 141 Indiana fox squirrel testis specimens collected from all seasons, the stage of sexual activity was determined as shown by spermatogenic development. The testicular changes observed microscopically were summarized and described, and a classification for the stages of spermatogenesis was prepared to include the infantile, prepubertal, functional, degenerating, and redeveloping testis... It is apparent that all testis stages are found at all seasons except that redeveloping males were found only in the fall. Since most prepubertal testis activity was also noted then, it is suspected that some environmental influence stimulates fall testis growth."

Lieb, Joel R., and Charles G. Wilber. (St. Vincent's Coll.) SOME HEMATOLOGICAL STUDIES ON THE ALASKAN GROUND SQUIRREL. Trans. Am. Micros. Soc. 73(4): 412-415. Oct. 1954.
On blood cells.

Lutz, H. J. (Yale U.) DAMAGE TO PAPER BIRCH BY RED SQUIRRELS IN ALASKA. J. For. 54(1): 31-33, 2 figs. Jan. 1956.
Narrow girdling of young birches is ascribed to Tamiasciurus. Damage is described and illustrated and figures are given on its frequency. One year before damage was first observed, there was a heavy crop of spruce seed that is presumed to have caused temporary increase of squirrel population.

Mossman, H. W., R. A. Hoffman, and C. M. Kirkpatrick. (U. of Wis. and Purdue U.) THE ACCESSORY GENITAL GLANDS OF MALE GRAY AND FOX SQUIRRELS CORRELATED WITH AGE AND REPRODUCTIVE CYCLES. Am. J. Anat. 97(2): 257-301, 6 plates. Sept. 1955.
Good histological descriptions and photomicrographs of bulbo-urethral, bulbar, and prostate glands and seminal vesicles and their cyclic changes. Gross anatomy of these structures is treated briefly.

BEAVER

Hodgdon, Kenneth W., and John H. Hunt. (Me. Dept. Game.) BEAVER MANAGEMENT IN MAINE. Me. Dept. Inland Fish. & Game, Game Div. Bul. no. 3. ix + 102 p., illus. June 1953. Reissued under date of Aug. 1955.
Rerun without revision. For review see WR 75: 35.

Retzer, John L. (For. & Range Exp. Sta., Ft. Collins, Colo.) PHYSICAL ENVIRONMENTAL EFFECTS ON BEAVERS IN THE COLORADO ROCKIES. Proc. 35th Ann. Conf. W. Assn. State Game & Fish Comms. p. 279-287. 1955.

From summary: "A study was made on 61 streams at high elevations... The study revealed that beavers are not found where valley grades exceed 15 percent slope and about 70 percent of all beavers live where slopes are less than 6 percent. Valleys that are only channel wide are unfavorable habitats. Erosion caused by beavers is primarily channel erosion. Stream sections once occupied but now abandoned had 10 percent more unstable channels than sections currently occupied or those never occupied. Channel stability was also related to the kind of rock. In glacial till, granite, and schist, 75 percent of the channels were safe compared to 67 percent in rhyolite and 40 percent in shale. From the data a suitability classification of the physical environment was developed as a guide to beaver management. Four suitability classes were defined."

Townsend, Joseph E., and Fletcher E. Newby. (Mont. Dept. Game.) MONTANA BEAVER MANAGEMENT. Proc. 35th Ann. Conf. W. Assn. State Game & Fish Comms. p. 269-278. 1955.

In 1953 the Mont. Game Dept. got authority to prescribe beaver regulations. The system and how it is handled are described here. The system seems noteworthy for complexity, flexibility, and adequacy. The area unit is the warden district; the warden administers local aspects of the system, assigns trapping areas, advises on population levels, etc. Levels are also determined by aerial survey, harvest data, and reports on damage alleviation. A quota is set for each area; it is prorated among trappers who have applied to trap in that area. Where sustained yield is desired, seasons are set for spring, when pelts are best and when ♀♀ will have mated. Population reduction is achieved by fall trapping, omission of royalty fees, and declaration of "no limit" areas. Pelts must be tagged before transport and again before sale. Tag numbers allow technicians to determine locality of origin of a pelt. Age groups and hence relative reproductive success are determined from size groups of pelts. Indications are that population was at saturation point in most areas, and that young were most numerous where populations were not densest. Tables show monthly variation in pelt prices, monthly variation in sex ratio of trapped beaver, and relationship of age ratio to population density.

MUSKRAT AND NUTRIA

Alexander, Maurice M. (N. Y. State Coll. For., Syracuse 10, N. Y.) THE MUSKRAT IN NEW YORK STATE. Dept. For. Extension, State U. of N. Y., Syracuse 10, N. Y. 1-16 p., illus. 1956.

Extension pamphlet that tells briefly about habits, trapping, and management of muskrat. Encourages reader to create and manage marshes for muskrats.

Allin, A. E. (Ft. Wm., Ont.) NUTRIA, MYOCASTOR COYPUS, IN THUNDER BAY DISTRICT, ONTARIO. Can. Field-Nat. 69(1): 24-26. Jan.-Mar. [Dec.] 1955.

Several records of feral nutria.

Davis, R. A. (Min. Agr., Tolworth, Surbiton, Surrey, Eng.) THE COYPU. Discovery 16(6): 237-239, 2 figs. June 1955.

Dispersal and habits of nutria in England. The animal has widened its range in England considerably in recent years but has not become abundant, partly because of heavy trapping for pelts, which bring 25s. No barking of trees, no really serious damage from burrowing, and only a little crop damage have been reported. Nutria have cleared out certain stands of Phragmites communis. They feed heavily on Typha and Juncus sp. Also eaten are the grass Glyceria, the sedge Cladium, the water-parsnip Sium, and many other aquatic plants. Nutria can stay submerged for half an hour, which is remarkable even for an aquatic animal. Apparently the species is not considered dangerous in Britain at present, partly because it is easily trapped.

Wilson, Kenneth A. (N. C. Wildl. Resources Comm.) EFFECTS OF WATER LEVEL CONTROL ON MUSKRAT POPULATIONS. N. C. Wildl. Resources Comm., Job Completion Rep., Project W-6-R. 10 p., maps & graphs. Oct. 1955.

Gives data on water-level fluctuations in diked and undiked marsh and on muskrat house counts and harvests. Marsh studied is in extreme ne. N. C. "On marsh where an abundance of food and cover are present, a close correlation exists between the amount of year-round water in the habitat and the muskrat population present. Undiked marsh often void of water averaged .16 houses per acre while diked marsh flooded by year-round water averaged from .65 to .88 houses per acre, or from four to about six times as many houses. Harvest data also indicated that diked marsh yielded about six times as many muskrats as undiked marsh."

Wilson, Kenneth A. (N. C. Wildl. Resources Comm.) LITTER PRODUCTION OF COASTAL NORTH CAROLINA MUSKRATS. Proc. SE. Assn. Game & Fish Comms., New Orleans, La., Nov. 1, 2, 1954. p. 13-19, 4 figs. [Dec. 1955.]

Except during exceptionally cold winters, breeding went on throughout year, with major peak Apr.-May and lesser peak Aug.-Sept. Few sterile adult ♀♀ were found. Muskrats with placental scars varied in wt. from 2 lbs. to 3 lbs. 10 oz. Numbers of placental scars rose with wts. of ♀♀. Scar counts averaged 10.9 per uterus. Fading of placental scars is discussed. Litter size varied from 1 to 6 and averaged 3.7. Some local variation in litter size was noted, with av. of 3 from Pea Is. and av. of 3.6 for Currituck Co. True potential productivity for coastal N. C. was thought to be represented by an av. litter of 3.7, with 3 litters and about 11 young per ♀ per year. Low yields of muskrats from tidal marsh of Currituck Co. were attributed to raccoon predation on nestlings. Two years of raccoon control restored muskrat populations on 2 marshes while populations of rest of county remained low.

Wragg, L. E. (U. Wis.) NOTES ON MOVEMENTS OF BANDED MUSKRATS. Can. Field-Nat. 69(1): 9-11. Jan.-Mar. [Dec.] 1955.

Recaptures of muskrats banded near Oshawa, Ont., showed that "During the year half the animals remain in a restricted locality, and possibly a half but more certainly a third move to new feeding grounds... Young apparently distribute themselves away from the home cabin... Movement tends to be along water courses and does not appear to be stimulated necessarily by population pressure or lack of food."--L. F. Stickel.

FUR ANIMALS, GENERAL

Butler, Frank R. (B. C. Game Comm.) CONSERVATION OF FUR-BEARING ANIMALS IN BRITISH COLUMBIA. Proc. 35th Ann. Conf. W. Assn. State Game & Fish Comms. p. 266-268. 1955.

Tells why the author invented the registered trap-line system and how the system is operated in B. C. The plan has been highly successful in perpetuating the resource and protecting trappers.

Chansler, Walter S. SUCCESSFUL TRAPPING METHODS. D. Van Nostrand Co., N. Y. 3, N. Y. 151 p., illus. 1955. $3.95. [From Outdoor News Bul. 10(4).]

"...a comprehensive yet easily read book which discusses the hows and whys of trapping all of the popular furbearing animals. It was the author's purpose to set forth his information in such a manner that it would be equally useful to the youngster who has never set a trap and to the professional trappers who realize the value of knowing 'the other fellow's' experiences and methods."

Senger, Clyde M., and Kenneth A. Neiland. (Mont. Agr. Exp. Sta., Bozeman.) HELMINTH PARASITES OF SOME FUR-BEARERS OF OREGON. J. Parasit. 41(6): 637-638. Dec. 1955.

MUSTELIDS

Greer, Kenneth. (Mont. Game Comm.) THE OTTER'S DIET--GOOD OR BAD? Mont. Wildl. 5(3): 14-17, illus. Fall 1955 [1956].
Report on food items found in 1,374 scats from Gary's Lake and Thompson Lakes, Mont. Fishes, frogs, and aquatic insects were main foods, but some snakes, birds, and mammals were eaten. Fishes in scats are discussed in relation to availability. Otter are not believed to menace fishing in the areas studied. Remains of muskrat and beaver in a few scats are thought to indicate top-heavy, vulnerable populations of these rodents. Open season on otter is not recommended.

Greer, Kenneth R. (Mont. Game Comm.) YEARLY FOOD HABITS OF THE RIVER OTTER IN THE THOMPSON LAKES REGION, NORTHWESTERN MONTANA, AS INDICATED BY SCAT ANALYSES. Am. Midl. Nat. 54(2): 299-313, illus. Oct. 1955.
Scats were collected in 2 areas over a period of a year. Analysis of contents of 1374 scats was made on a seasonal and area basis; data are presented in tabular form. Main foods were fishes and invertebrates. Representation of most species of fish in scats was not in proportion to fish numbers in the area as determined by electric shocking, gill net sets and fishing. Representation of fur bearer remains, however, appeared to be in proportion to availability, as judged from observation of sign.--L. F. Stickel.

DOGS, WOLVES, FOXES

Ameel, Donald J. (Kans. State Coll.) PARASITES OF THE COYOTE, CANIS LATRANS SAY, IN KANSAS. J. Parasit. 41(3): 325. June 1955.

Bromley, A. W. (N. Y. Cons. Dept.) ADIRONDACK COYOTES. N. Y. State Cons. 10(4): 8-9, illus. Feb.-Mar. 1956.
Early records, past range, present range, relation to deer and hares. Coyotes seem to concentrate in areas of high snowshoe hare populations. They have not prevented general increase in deer of Adirondacks, but increased coyote control will be practiced in fringes of Adirondacks on behalf of deer hunters.

Layne, James N., and Warren H. McKeon. (U. Fla. & N. Y. Cons. Dept.) NOTES ON THE DEVELOPMENT OF THE RED FOX FETUS. N. Y. Fish & Game J. 3(1): 120-128, illus. Jan. 1956.
From abstract: "The gross aspects of red fox fetal development from about the 30th day of gestation until term are described on the basis of 160 specimens aged according to a fetal growth curve of body weight established for captive silver foxes." Should be of value in estimating ages of embryos and dates of conception.

Layne, James N., and Warren H. McKeon. (U. Fla. & N. Y. Cons. Dept.) SOME ASPECTS OF RED FOX AND GRAY FOX REPRODUCTION IN NEW YORK. N. Y. Fish & Game J. 3(1): 44-74, illus. Jan. 1956.
Reproduction in relation to rabies control. Data on numbers, sex ratios, breeding seasons, and fecundity were obtained for 3 natural regions of N. Y., 1951-53. Reds outnumbered grays about 10-1. Neither species changed appreciably in abundance during the period despite trapping for control. Population indices and reproductive rates of reds varied regionally. Average annual productivity was about 214% per adult for reds, 182% for grays. Regionally, av. annual productivity of reds ranged from 180% to 320%. It is suggested that breeding potential is to some degree indicative of how favorable the relation is between population level and carrying capacity. Thus trapping for control may result in increased relative productivity. It seems that grays could be reduced 64% annually and reds 68% and still be able to make full recovery next year. Heavier reduction than this probably is seldom attained in present rabies control work. There is, however, a possibility that sustained trapping might hold numbers low enough to lower the rate of rabies transfer without actually causing sustained scarcity in the population. Trapping is now being moved into the epizootic counties; it should prove whether removal of annual surpluses will reduce frequency of rabies in foxes.

Stenlund, Milton H. (Box 645, Ely, Minn.) A FIELD STUDY OF THE TIMBER WOLF (CANIS LUPUS) ON THE SUPERIOR NATIONAL FOREST, MINNESOTA. Minn. Dept. Cons., Tech. Bul. no. 4. 1-55 p., illus. 1955.

A notable contribution to wolf biology presented in the form of an attractive, substantial bulletin. Among subjects discussed are: distribution in state; population levels and reasons for concentrations; litter size (av. of 6.4); food habits (deer is only important food); weights and measurements; size and composition of packs; travel and hunting habits; effects of predator control and the bounty; parasites; sex ratios; relation of wolves to deer populations; relation of wolves to wilderness policy. The wolf population of the forest is the largest remaining in U. S. Deer and hence wolves are concentrated in the logged and burned portions, but even these portions have entered successional stages in which deer and wolf numbers are declining. Population level of 1 wolf per 17 sq. mi. is estimated for part of forest. Wolves were found to travel within their home ranges and to use same trails time and again, but use of circular routes could not be demonstrated. Annual take of population under bounty is about 41%, and since population seems stable, bounty may be controlling. However, it is not known what would happen without bounties; natural controls appear to keep wolf numbers down where there is little or no predator control. Wolves kill deer unselectively; age and sex groups of prey are like those of population as a whole. A pack of 3 kills about 1 deer per 4 days in winter. Wolves kill about 16% of deer herd each year. Deer still starve in hard winters. Wolves are good for the herd in these winters, and at all times in areas inaccessible to hunters. Their protection in wilderness areas is highly desirable.

CATS

Backus, Bill. (Elizabeth [N. J.] Daily Journal.) PERSISTENT REPORTS BRING US THE MOUNTAIN LION. N. J. Outdoors 6(7): 12-13. Jan. 1956.

For better or worse, cougar reports keep cropping up in eastern states. Here a newspaper outdoors editor details one report for N. J. and mentions a few others.

Dear, L. S. (Pt. Arthur, Ont.) COUGAR OR MOUNTAIN LION REPORTED IN NORTHWESTERN ONTARIO. Can. Field-Nat. 69(1): 26. Jan.-Mar. [Dec.] 1955.

Apparently reliable sight records.

Dufresne, Frank. CRAZY COUGARS. Field & Stream 60(8): 46-47, 86-88. Dec. 1955.

In parts of Vancouver Is., B. C., it is "not a question of will cougars attack a human, but when and why." Apparently deer are at a population low and the cougars are desperate for all sorts of prey. They stalk boldly around settlements and a number of attacks on people have been reported. Attacking cats are generally small, thin females. About 300 cougars were killed on the island in 1954 without visible effect. No adequate form of control is known.

Seagears, Clayt. (N. Y. Cons. Dept.) FELINE FLYING SAUCER. N. Y. State Cons. 10(3): 48-49, illus. Dec.-Jan. 1955-56.

Pumas in N. Y.? Plenty of popular reports, but Seagears is skeptical and solicits better evidence. There is even room for doubt about the pumas supposed to be in New Brunswick, according to a district forester and "crack woodsman" from that province. None of the N. B. pumas have been shot; in N. Y. the sight reports seem to stop with the coming of snow, when tracks could give real evidence.

Walsh, Bill. PANTHERS ARE POPULAR. Pa. Game News 27(1): 4-10, illus. Jan. 1956.

The numerous panther stories currently getting into Pa. newspapers are taken with a whole carton of salt.

BIG GAME, GENERAL

Allen, Rex W. (Agr. Res. Serv., USDA.) PARASITES OF MOUNTAIN SHEEP IN NEW MEXICO, WITH NEW HOST RECORDS. J. Parasit. 41(6): 583-587. Dec. 1955.

Anon. ELK HERD CREATES PROBLEM IN MICHIGAN. Modern Game Breeding & Hunting Club News 25(12): 16. Dec. 1955.

"Michigan's elk herd, estimated at more than 600 animals, threatens to create a problem in game management. The herd, which started with the release of seven elk [from Yellowstone] in the Pigeon River state forest near Vanderbilt [Otsego Co.] in 1918, has grown rapidly in the last few years. Conservation workers sighted more than 200 in less than an hour last month. Private landowners in the area have complained recently that elk are causing damage to pine, cherry and other trees with low branches. Game specialists think the mauling of the trees may be an effort by the elk to polish their antlers. ...some control of the herd must be exerted if tree damage continues. Possible solutions include: issuance of permits to landowners to kill damage-causing elk, a restricted hunting season with a limited number of elk taken, or trapping elk and transferring them to remote grassland areas to reduce concentrations in the Vanderbilt area."

Brandborg, Stewart M. LIFE HISTORY AND MANAGEMENT OF THE MOUNTAIN GOAT IN IDAHO. Idaho Dept. Fish & Game, Wildl. Bul. no. 2. 1-142 p., illus. [Dec.] 1955.

An important and comprehensive monograph that takes up many topics including: past and present numbers; distribution; habitats; food habits; use of licks; relation of age to size, weights, dentition, and horn growth; other physical features; behavioral features; social groups; daily activities; travels; reproduction and productivity; parasites and disease; relationship to various predators; accidents; and management. Work was done in Idaho and Mont., 1947-53. Goats still occur over most of their original range. Idaho has about 2,785 goats divided into many small, scattered herds. Depletion of winter food apparently has caused natural reduction of many herds. Horn and tooth characters are useful in determining age. Polygamy is the rule, so ♂♂ can be shot with little harm to herd; it is, however, difficult to distinguish sexes at a distance, so hunters must be taught to spare ♀♀ with kids. Reproductive potential is high; under favorable circumstances it may reach level of nearly 1 young per year for each ♀ over 2 years of age. Young-female ratios of 50:100 and 70:100 are fairly typical. Mortality is high during first 2 years. Management of hunting is difficult because the many scattered herds vary in accessibility so much that hunting pressure is extremely uneven, and because a managing agency cannot keep up all the needed census work. Kills have been small in proportion to populations. Special permit hunting units have been set up. Permits have been granted with aim of getting 10% kill of individual herds that were known to be at a level suitable for hunting. There has been trouble getting enough applications for permits to hunt less accessible herds.

Buechner, Helmut K. (State Coll. Wash.) THE FUTURE OF THE BIGHORN SHEEP. Anim. Kingdom 59(1): 2-10, 7 photos. Jan.-Feb. 1956.

With the aid of the N. Y. Zool. Soc. and the Cons. Found., Dr. Buechner has made a study of bighorns in the U. S. Here he tells about his findings: numbers in various states and herds, condition of herds and their ranges, causes of declines and what can be done about them, and general management recommendations. Population of each subspecies is tabulated by state. National total is between 15,000 and 18,200. For each of 3 of the 4 living races, there are more than 3,000 individuals. For the 4th, O. c. californiana, there are about 300. Management recommendations call for reducing competition from deer, elk, and livestock; keeping herds below epizootic danger level; permitting limited hunting of rams; guarding against poaching; transplanting; and keeping the large wilderness and refuge areas that we now have for these animals.

Couey, Faye M. (Mont. Game Comm.) THE BIGHORNS ARE BACK! Mont. Wildl. 5(3): 6-8, illus. Fall 1955 [1956].

Brief statement of status of various herds in Mont., results of recent permit hunts, and notes on restoration plans.

Couey, Faye. (Mont. Dept. Game.) MONTANA BIGHORN SHEEP. Proc. 35th Ann. Conf. W. Assn. State Game & Fish Comms. p. 162-166. 1955.

Most bighorn herds in Mont. are increasing. Trapping and transplanting give best results if sheep are confined in large pasture on new area for a time before release. Transplanting is most basic management we can apply at present. Limited hunting of some herds is permitted on permits. Most declines have been correlated with overuse of range by bighorns themselves or by bighorns and other game or livestock. Main disease appearing in recent years is pneumonia associated with lung worms. Studies show that most bighorns have lungworms, so die-offs might occur whenever other circumstances favored them. In general, however, bighorn picture is the brightest statewide that it has been in 30 years.

Honess, Ralph, and Kenneth Winters. (Wyo. Game Comm.) WHAT ABOUT THE BIGHORN? Wyo. Wildl. 20(2): 20-23, illus. Feb. 1956.

Figures for various herds show that Wyo. bighorns have declined greatly in numbers in recent years, chiefly from verminous pneumonia, partly from competition with other herbivores. Authors suggest acquiring and managing some tracts of winter range solely for bighorns and effecting redistribution by transplanting.

Jaczewski, Zbigniew, and Krzysztof Swierzynski. ANAESTHESIA IN THE EUROPEAN BISON (BISON BONASUS L.) BY CHLORALHYDRATE (CHLORALUM HYDRATUM). Zool. Poloniae, Arch. Soc. Zool. Poloniae (Wroclaw) 6(2): 80-87. 1955. [From J. Mamm. 36(4).]

In Polish.

Jones, Fred. L. (Calif. Dept. Game.) BIGHORN MANAGEMENT PROBLEMS IN CALIFORNIA. Proc. 35th Ann. Conf. W. Assn. State Game & Fish Comms. p 177-181. 1955.

Calif. has about 2,500 bighorns resident in 59 mountain ranges. They now suffer from competition with deer for forage and with burros for water supplies. There is continuing poaching, but there is no great competition with livestock today, and no great predation problem. The author shows that precipitation has varied widely on both long-term and short-term basis. This is important, especially in desert ranges, in governing supply of food and water. There are suggestions that reproductive success varies with precipitation. Lack of summer water prohibits bighorn use of some ranges. Water developments have been made and more are planned; response to them is sometimes excellent, sometimes surprisingly poor. Some of the denser, resident herds have more adult males than is favorable for the population, and such populations should be subjected to limited hunting. Also, it should be legally possible to control burros where they are a threat to the status of bighorns.

McClellan, Jim. (N. M. Dept. Game.) PRELIMINARY REPORT ON THE BARBARY SHEEP OF NEW MEXICO. Proc. 35th Ann. Conf. W. Assn. State Game & Fish Comms. p. 167-176. 1955.

Ammotragus lervia has been established in the Canadian River Canyon of ne. N. M. and has been introduced into Palo Duro Canyon of nw. Texas. This article presents what the author has been able to find out about the sheep from field work, from zoos, etc. Data are given on appearance and structure, weights and measurements, habitat in N. M., behavior, attempts to determine numbers by aerial and ground surveys, breeding habits, list of parasites, and hardiness. The N. M. herd is thought to number about 200. The animals are large, hardy, apparently resistant to effects of disease and parasites, able to take care of themselves, and have very palatable flesh.

Morris, Melvin S. (Mont. State U.) ELK AND LIVESTOCK COMPETITION. J. Range Mgt. 9(1): 11-14. Jan. 1956.

A review paper (35 references) that discusses the problem and its several solutions from a neutral viewpoint. The solution favored by author is to bring together all local interests, let them study the situation for months or years, and encourage them to hammer out an arrangement that is fair to all.

Nilsson, Nils N. (Nev. Game Comm.) GRASS RESEEDING PROGRAMS IN RELATION TO WINTER DEER RANGES. Proc. 35th Ann. Conf. W. Assn. State Game & Fish Comms. p. 138-141. 1955.

Large-scale, public land reseeding programs that are described are altering great areas of the West. Game departments should cooperate closely in these programs to prevent destruction of important winter range for big game. Effects of these reseeding programs on big game should be studied carefully at this time of transition. Meanwhile, we should strive to put into effect the range management practices that have proven worth. Reseeding should be restricted to times when moisture conditions are favorable, for drought has wrecked some projects and has even resulted in halogeton taking over instead of grass.

Noble, Glenn A. (Calif. State Poly. Coll.) AN INTESTINAL AMOEBA FROM THE PRONG-HORNED ANTELOPE. Trans. Am. Micros. Soc. 72(3): 248-252, illus. July 1953.

Russo, John P. (Ariz. Game Dept.) THE DESERT BIGHORN SHEEP IN ARIZONA / A RESEARCH AND MANAGEMENT STUDY. Ariz. Game & Fish Dept. vi + 153 p., 30 figs. Jan. 1956.

An attractive and substantial bulletin that describes the habitat and provides data on history and numbers in state, food habits, predation, competition with deer and livestock, weights and measurements, taxonomy, reproduction, sex and age ratios, vitamin A content of livers, parasites, disease, and management. Breeding season seems to be an extended one. Range now includes about 1/3 of Ariz. Grasses and such shrubs as coffeeberry, ironwood, paloverde, and catclaw are important foods. Deer and feral livestock are competitors for food and water. More drinking places should be provided. Feral livestock should be reduced and grazing by cattle should be limited. Predators should be controlled as necessary. Trapping and transplanting is desirable. Limited hunting of rams should continue.

Swank, Wendell G. (Ariz. Game Dept.) BULL ONLY VERSUS HUNTER'S CHOICE, A HISTORY OF ELK MANAGEMENT IN ARIZONA. Proc. 35th Ann. Conf. W. Assn. State Game & Fish Comms. p. 155-161, maps & graphs. 1955.

After discussing history, distribution, productivity, and population trends of elk in Ariz., the author takes up effects of hunting regulations. "Bull only hunts from 1935 to 1943 resulted in a hunter harvest of 1,327 elk. Hunts from 1947 to 1953 in which all classes of animals were harvested produced a hunter harvest of more bulls every year than was produced in any year during the bull only era. In addition, 5,650 antlerless and spike elk were harvested. In each year, 1950, 1951, and 1953, more elk were taken in the state than were taken during the entire period from 1937 to 1943." Trend of kill and surveys indicate that population has been reduced. Some reduction was desired because of elk competition with turkey, deer, and livestock, and because of damage to range and crops. "In the opinion of the author the future of elk management in Arizona lies in issuing a controlled number of permits for the taking of elk of either sex."

Young, Stanford. (Utah State Agr. Coll.) BIG GAME EXCLOSURES IN WILDLIFE MANAGEMENT IN UTAH. Proc. Utah Acad. Sci. 32: 65-69. 1955.

A survey was made of the 36 big-game exclosures that existed in Utah in 1954. The author tells what vegetative types these exclosures are placed in, discusses the values of exclosures for research and demonstration, and makes several suggestions for improving exclosures. Among other things, they should be built for permanence, for their value increases with time. They should be larger, in many instances. There should be at least one for each major range type. Part of each should be rabbit-proof where rabbits are a problem. There should be signs to explain and protect the structures and their vegetation. Studies made at them should be standardized and repeated.

DEER (Odocoileus)

Anon. [Casey E. Westell, Jr.] DEER AND ASPEN. Am. Box Board Co., Filer City, Mich. 20 unnumbered p., illus. [1955.]
This pamphlet is unusual in being beautifully illustrated with a color photograph on each page. It is of additional interest because it may be the first thing of its type that has been issued by a commercial company to familiarize the public with a wildlife problem. The problem in question is the need of reasonable herd control to prevent starvation of deer and destruction of young stands of valuable aspen that spring up so densely after fire or cutting. Material is based on information Westell has published elsewhere, including J. Wildl. Mgt. 18(2) and Mich. Wildl. no. 1, the latter with S. A. Graham.

Anon. NOTES OF "WILDERNESS" DEER. N. Y. State Cons. 10(3): 38, illus. Dec.-Jan. 1955-56.
Six good photographs contrast antlers of 1.5-, 2.5-, and 4.5-year-old deer from good range and poor Adirondack range. Differences are enormous--practically no antlers vs. fine antlers. Provides excellent demonstration material for educational use.

Crane, Harold S. (Utah Dept. Game.) NEW HARVEST METHODS AS A MEANS OF CORRECTING DEER PROBLEMS. Proc. 35th Ann. Conf. W. Assn. State Game & Fish Comms. p. 128-130. 1955.
In addition to having an 11-day either-sex season, Utah has an amazingly flexible system of special hunts that permit concentrating desired amounts of hunting pressure when and where it is needed to regulate herds or to stop given cases of damage. The following types of hunts or seasons are discussed briefly: early seasons, antlered only, short season, extended straight seasons, extended week-ends, special antlerless permits, two deer areas, two deer special permits, five day notice post-season, and conditional hunts. Many deer problems have been corrected by applying one or more types of hunts that were appropriate to the situation.

Denney, Richard N. (Colo. Game Dept.) DEER DAMAGE PROBLEMS IN COLORADO. Proc. 35th Ann. Conf. W. Assn. State Game & Fish Comms. p. 131-134. 1955.
Summary: "1. The principal deer damage in Colorado is to: hay stacks, alfalfa hay and seed crops, fruit orchards, grain crops, and miscellaneous truck crops, as well as winter browse range. 2. Contributing factors to damage are: intensified land use, competition with stock and game and the resultant over-grazing, high deer numbers, reduction of range to cropland, high commodity prices, posted land, and the damage law. 3. Damage control methods are: fencing, herding, scaring devices, killing, repellents, and artificial feeding. 4. Deer damage is directly related to the severity of the winter."

Ferguson, Robert B. (Utah State Agr. Coll.) THE WEATHERING AND PERSISTENCY OF PELLET GROUPS AS IT AFFECTS THE PELLET GROUP COUNT METHOD OF CENSUSING MULE DEER. Proc. Utah Acad. Sci. 32: 59-64. 1955.
Fifty-eight groups of pellets were placed in a variety of outdoor sites near Logan, Utah, and were studied for 17 months. Pellets changed little during winter. Protection by vegetation decreased weathering more than aspect of topography did. All groups were intact after 6 months and only 8% were destroyed after 6-10 months. 24% of all groups studied were damaged by insects or other animals between the time of redistribution (Nov.-Mar.) and May. Pellets weather most from May to Oct. Pellets of one winter can be distinguished readily from pellets of previous winters by criteria that are listed.

Flyger, V. F. (Ches. Biol. Lab., Solomons, Md.) BIOLOGISTS TRY NEW AGING METHOD FOR DEER. Md. Tidewater News 12(8): 1, 3, illus. Jan. 1956.
"A new wrinkle was added to the examination of deer shot by hunters this year. Biologists made clay impressions of teeth in the deer's lower jaw using a metal channel filled with modeling clay. Later a plaster cast was made in the laboratory from each of the impressions. These plaster casts are exact replicas of the deer's teeth and enable one skilled man in the laboratory to determine carefully the age of all the deer... Heretofore the number of deer that could be aged every year...was determined by the number of trained men available."

DEER (Odocoileus)--Continued

Haugen, Arnold O. (Ala. Poly. Inst.) MORE BUCKS TO HARVEST. Ala. Cons. 27(3): 16-19, illus. Nov.-Dec. 1955.
Data on deer hunting in Choccolocco Management Area, Ala. Tables give hunting statistics, relation of weight to age, and relation of antler points to age.

Lauckhart, J. Burton. (Wash. Game Dept.) IS DEER RESEARCH AHEAD OF DEER MANAGEMENT? Proc. 35th Ann. Conf. W. Assn. State Game & Fish Comms. p. 142-144. 1955.
There has been a huge amount of deer research since PR work began but we still lack many answers. It is often impossible to get even good population trend data because of variations in animal distribution. Determination of carrying capacity of a range is very elusive because capacity varies widely from year to year. We still do not know how to determine overutilization of large and highly varied ranges. Laborious browse studies have had limited application because of great variation in growing conditions in different years. Examination of condition and trend plots every 4-5 years are being substituted for annual surveys and they may provide better guides. We do not know how to improve damaged deer ranges or how to make the desired plants grow. We are not even sure of effect of livestock competition; perhaps use of grass by livestock favors deer browse in the competition for moisture. Large areas must be managed on the basis of average conditions and there will always be overstocked and understocked areas. Perhaps the best way to study game ranges is to study condition and productivity of the game itself. On the whole, research has solved possibly half of the deer problems. Trial and error will continue to be important.

Longhurst, William M. (U. Calif., Field Sta., Hopland, Calif.) THE ROLE OF PARASITISM IN THE POPULATION DYNAMICS OF A HERD OF BLACK-TAILED DEER. Proc. 35th Ann. Conf. W. Assn. State Game & Fish Comms. p. 145-154. 1955.
Presents and discusses 6 tables that give data on causes and seasons of mortality, herd composition, and reproduction of deer at the Hopland Field Station, Mendocino Co., Calif. "In general, it is evident that under the conditions encountered at Hopland, parasites can contribute significantly to losses of fawns during their first winter and to a lesser extent to the losses of yearlings during their second summer. Few older deer carry sufficient numbers of worms to be affected. Likewise the magnitude of losses involving parasitism can be increased by severe weather and overstocked conditions."

Lueth, Francis X. (Ala. Dept. Cons.) WHY SHOOT SPIKES? Ala. Cons. 27(3): 12-13, 19, 26-27, illus. Nov.-Dec. 1955.
Information on ages and weights of spike bucks in Ala. Many spike bucks are not young and it is best from all points of view to open the season on them. This has now been done. A series of 9 photos shows how very different antler development can be on deer of 1.5 years.

Mace, Robert U. (Ore. Game Comm.) INDICES BY WHICH DEER PROBLEMS CAN BE RECOGNIZED IN THE EARLY STAGES. Proc. 35th Ann. Conf. W. Assn. State Game & Fish Comms. p. 135-137. 1955.
Indices suggested include: studies of forage conditions, crop damage, deer weights, antler development, reproductive success. When indices point to overpopulation, various control methods must be considered, for no single method will solve all problems.

Severinghaus, C. W. (N. Y. Cons. Dept.) HISTORY, MANAGEMENT, AND ECOLOGY OF WHITE-TAILED DEER IN ALLEGANY STATE PARK. N. Y. Fish & Game J. 3(1): 80-87, illus. Jan. 1956.
Deer entered the park about 1920 and increased rapidly in this refuge. Starvation losses were numerous in 1939-40 and have occurred every winter since. Numbers lost are reported. Hunting has been permitted in part of park since 1944; yearly bags are reported. Winter food conditions were studied at 76 stations in 1945 and 1955. Average reduction in browse was 83% in one area and 85% in another. Twelve species were completely eliminated; most of those remaining are seldom eaten except by starving deer. "The contrast between the legal take of 1,506 and the calculated winter-kill of 6,940 is great... It is quite obvious that it has done no good to prohibit hunting on the greater part of the Park area with the hope of saving deer."

Severinghaus, C. W., and C. P. Brown. (N. Y. Cons. Dept.) HUNTING ACCIDENTS IN RELATION TO TYPES OF DEER SEASONS. N. Y. Fish & Game J. 3(1): 88-92. Jan. 1956.
"A study of deer hunting accidents in New York during the period from 1941 to 1954 indicates that there was less likelihood of being mistaken for a deer or injured by gun fire when deer of either sex were legal game, than during seasons when antlered deer only could be taken."

Stoeckeler, J. H., and John W. Macon. (Lake States For. Exp. Sta., St. Paul 1, Minn.) REGENERATION OF ASPEN CUTOVER AREAS IN NORTHERN WISCONSIN. J. For. 54 (1): 13-16, 1 graph. Jan. 1956.
Quantitative data of value in deer browse studies.

Taber, Richard D. (U. Calif., Berkeley.) CHARACTERISTICS OF THE PELVIC GIRDLE IN RELATION TO SEX IN BLACK-TAILED AND WHITE-TAILED DEER. Calif. Fish & Game 42(1): 15-21, 4 figs. Jan. 1956.
Summary: "In both the Columbian black-tailed deer and the Virginia white-tailed deer, there are three principal characteristics of the pelvic girdle which indicate sex. One is the outline of pubic symphysis, which is thick and blunt in the male and more slender and pointed in the female. The second is the presence or absence of the suspensory tuberosity on the inter-ischial bone--the point of attachment of a suspensory ligament of the penis. The third is the relative length of the pubis, which is greater in the female. This may be expressed as a ratio of pubic length (from the symphyseal face to the lip of the acetabulum) to pubic symphysis depth. All of these characteristics become more pronounced with age."

Taft, Edgar B., Thomas C. Hall, and Joseph C. Aub. (Mass. Gen. Hospital, Boston.) THE GROWTH OF THE DEER ANTLER (2). N. Y. State Cons. 10(4): 4-5, illus. Feb.-Mar. 1956.
Brief, semitechnical account of endocrine control of antler growth.

Teeri, A. E., E. Pomerantz, N. F. Colovos, and H. A. Keener. (U. of N. H.) VITAMIN EXCRETION BY DEER. J. Mamm. 36(4): 553-557. Nov. 1955.
Three penned whitetails fed balsam fir showed slight synthesis of nicotinic acid and riboflavin, extensive and probably significant synthesis of thiamine and B_{12}. The latter indicates the indispensability of cobalt in the ration, for B_{12} cannot be synthesized in its absence.--L. F. Stickel.

MAMMALS--MARINE

Chiasson, Robert B. (Stanford U.) DENTAL ABNORMALITIES OF THE ALASKAN FUR SEAL. J. Mamm. 36(4): 562-564, 1 photo. Nov. 1955.

Edinger, Tilly. HEARING AND SMELL IN CETACEAN HISTORY. Monatsschr. Psychiat. & Neurol. (Basle): 129(1-3): 37-58, illus. 1955. [From J. Mamm. 36(4).]

Gilmore, Raymond M. (Scripps Inst., LaJolla, Calif.) THE RETURN OF THE GRAY WHALE. Sci. Am. 192(1): 62-67, illus. Jan. 1955. [From J. Mamm. 36(4).]

Scheffer, Victor B. (US F&WS, Colo. A & M Coll.) BODY SIZE WITH RELATION TO POPULATION DENSITY IN MAMMALS. J. Mamm. 36(4): 493-515, graph. Nov. 1955.
"The Alaska fur seal population increased 4.3 times between 1913-20 and 1941-52, and since the early 'forties has remained on a plateau. During the rise of the population the mean body size of the seal apparently decreased... Cessation of herd growth in the 1940's is ascribed, largely on circumstantial evidence, to increased mortality of young seals and to reduced rate of pregnancy. The decrease in body size is thought to be a primary result of competition among seals for food near the breeding grounds in summer. The decrease is correlated with, and may be partially linked with, a rise in the incidence of hookworm anemia. Hookworms, however, do not affect fur seals older than pups." Body size in relation to population density in other mammals is discussed on p. 506-511 through the medium of reviews of selected papers containing such data.--L. F. Stickel.

MAMMALS--MARINE--Continued

Steinmetz, H. BEITRÄGE ZUR GESCHICHTE UNSERER KENNTNISSE VOM SEE-ELEFANTEN. Zool. Garten (Leipzig) 21(1/2): 24-43, illus. Mar. 1955. [From J. Mamm. 36(4).]

Venables, U. M., and L. S. V. Venables. OBSERVATIONS ON A BREEDING COLONY OF THE SEAL PHOCA VITULINA IN SCOTLAND. Proc. Zool. Soc. London 125(3/4): 521-532, 4 figs. Nov. 1955.
Study of ecology, behavior, population structure.

MAMMALS--OTHER GROUPS

Moore, Joseph Curtis. (Am. Mus. Nat. Hist., N. Y.) OPOSSUM TAKING REFUGE UNDER WATER. J. Mamm. 36(4): 559. Nov. 1955.

BIRDS--GENERAL

Coulson, J. C., and E. White. ABRASION AND LOSS OF RINGS AMONG SEA-BIRDS. Bird Study 2: 41-44. 1955. [From J. Anim. Ecol. 24(2).]
"Abrasion of rings on kittiwakes occurs at the rate of 8.6% loss of weight per year, the rings becoming illegible after about four years. Correlative confirmation is offered for ringed manx shearwaters. Investigation of the effects of corrosion and abrasion is called for since the rings become illegible before the life-span of the wearer is completed."

BIRDS--MORPHOLOGY, PHYSIOLOGY, BEHAVIOR, MIGRATION

Davis, Earle A. (Coll. Osteopath., 1721 Griffin Ave., Los Angeles 31, Calif.) SEASONAL CHANGES IN THE ENERGY BALANCE OF THE ENGLISH SPARROW. Auk 72(4): 385-411, 4 figs. Oct. 1955.
Extensive, technical paper.

Hitchcock, Harold B. (Middlebury Coll., Middlebury, Vt.) HOMING FLIGHTS AND ORIENTATION OF PIGEONS. Auk 72(4): 355-373, 9 figs. Oct. 1955.
Behavior was followed by airplane and by ground observations of direction of disappearance upon release. Orientation and homing were generally less successful than expected. Homing under complete overcast in one trial and night flying of Hawaiian pigeons "suggest...that sun navigation may not be the only way in which pigeons can orient themselves."--L. F. Stickel.

Johnston, Richard F. (MVZ, U. Calif., Berkeley.) POPULATION STRUCTURE IN SALT MARSH SONG SPARROWS. PART I. ENVIRONMENT AND ANNUAL CYCLE. Condor 58(1): 24-44, 9 figs. Jan.-Feb. 1956.
Environmental factors affecting time of breeding, clutch size, territorial behavior, sedentariness, dispersal of young.

Marshall, A. J., and H. J. de S. Disney. (Med. Coll., U. London, Eng.) PHOTOSTIMULATION OF AN EQUATORIAL BIRD (QUELEA QUELEA, LINNAEUS). Nature 177 (4499): 143-144, 1 fig. Jan. 21, 1956.

Oakeson, Barbara Blanchard. (Santa Barbara Coll., Calif.) LIVER AND SPLEEN WEIGHT CYCLES IN NON-MIGRATORY WHITE-CROWNED SPARROWS. Condor 58(1): 45-50, 1 graph. Jan.-Feb. 1956.

Petersen, Arnold J. (St. Olaf Coll.) THE BREEDING CYCLE IN THE BANK SWALLOW. Wilson Bul. 67(4): 235-286, 22 figs. Dec. 1955.
Long, important paper on habits, behavior, reproduction, and physiological cycle. Correlations of various factors are considered.

Salomonsen, Finn. FUGLETRAEKKET OG DETS GÅDER (BIRD MIGRATION AND ITS MYSTERIES). Ejnar Munksgaard, Copenhagen. 224 p., illus. 1953.

A popular discussion, in Danish, of many aspects of bird migration. The author has compiled information from wide sources on physiology of migration, orientation, migration routes, bird eruptions, environmental influences on migration, and how research on migration is conducted. Examples used by the author are world-wide in scope; although they deal mainly with European birds, many American species are considered. The chapter on the origin of migration presents many ideas (not necessarily original) such as that birds with high metabolism must spend most daylight hours looking for food and are thus forced to migrate at night. Because of the long daylight period in the north, birds nesting there often raise more young than they could farther south. Glacial periods are not the cause of migration; migrations occur even in the tropics. The reason some birds spend summer south of their normal nesting grounds may be because the level of the hormone causing northern movement is not enough to bring the bird all the way to its usual nesting region. The last half of the book lists the birds of Denmark and gives an account of what is known about each bird's migration routes, where it nests and where it spends the winter. This is the most thorough review of bird migration of which the reviewer is aware.--V. F. Flyger.

Schwartzkopff, Johann. (Zool. Inst. U. Göttingen, Bahnhofstr. 28, Germany.) ON THE HEARING OF BIRDS. Auk 72(4): 340-347, 2 figs. Oct. 1955.

Analysis of the hearing ability of different birds in relation to their ear structure. Hearing in birds is hypothesized to include direct transmission of some tones to the brain and their analysis there, in addition to analysis in the ear.--L. F. Stickel.

BIRDS--MANUALS, FAUNAS, COMMUNITIES

Breckenridge, W. J. (U. Minn.) BIRDS OF THE LOWER BACK RIVER NORTHWEST TERRITORIES, CANADA. Can. Field-Nat. 69(1): 1-9. Jan.-Mar. [Dec.] 1955.

Annotated list of breeding birds in an area whose wildlife had not been reported on since the 1800's. Geese were abundant in 1834 and in 1855, but entirely absent in 1953; several possible explanations are discussed.--L. F. Stickel.

Roberts, Thomas S. A MANUAL FOR THE IDENTIFICATION OF THE BIRDS OF MINNESOTA AND NEIGHBORING STATES. U. Minn. Press. xiv + 459-738 p., 122 illus. 4th ed., revised. Dec. 1955. $3.50.

The Manual is prefaced by a "Systematic List of the Birds of Minnesota." The only revisions in the book occur in this list; they include revisions in nomenclature and listing of 6 additional species. No attempt was made to add these 6 species to the section "Keys and Descriptions," which is identical with that of the revised edition of Roberts' Birds of Minnesota (1936). The keys are constructed mainly for identifying birds in the hand, but summaries at ends of keys are an aid to field identification. W. J. Breckenridge's fine illustrations are a great aid in using the keys.--Barry L. Peterson.

BIRDS--POPULATIONS & FLUCTUATIONS

Johnston, David W., and Eugene P. Odum. (U. Ga.) BREEDING BIRD POPULATIONS IN RELATION TO PLANT SUCCESSION ON THE PIEDMONT OF GEORGIA. Ecol. 37(1): 50-62. Jan. 1956.

Birds were censused on 20-acre study plots of uniform habitat in four seral stages: grassland, shrubland, pine, and hardwood. A trend toward increased density (and number of species) of birds was interrupted by low densities in young pine forests. Reasons for this low density are discussed, and the recent invasion of the blue-headed vireo into this habitat is noted. A quantitative criterion for defining true forest-edge birds is presented.--L. F. Stickel.

BIRDS--PARASITES AND DISEASES

Manwell, Reginald D. (Syracuse U.) THE BLOOD PROTOZOA OF SEVENTEEN SPECIES OF SPARROWS AND OTHER FRINGILLIDAE. J. Protozool. 2(1): 21-27. Feb. 1955.

Sachs, Irving B. (U. Ill.) CERTAIN BLOOD INHABITING PROTOZOA OF BIRDS IN THE VICINITY OF URBANA, ILLINOIS. Trans. Am. Micros. Soc. 72(3): 216-227, 21 figs. July 1953.
158 small birds of 15 species were studied. 34 birds of 7 species had blood protozoans. Protozoans considered here are of genera Haemoproteus, Leucocytozoon, and Trypanosoma.

Schell, Stewart C. (U. Idaho.) FOUR NEW SPECIES OF MICROTETRAMERES (NEMATODA: SPIRUROIDEA) FROM NORTH AMERICAN BIRDS. Trans. Am. Micros. Soc. 72(3): 227-236, illus. July 1953.
From Bubo, Aquila, Accipiter, and Corvus.

PHEASANTS

Anon. PHEASANT FIASCO. N. M. Mag. 34(1): 34-35, illus. Jan. 1956.
New Mexico is not pheasant country; hatching and survival are poor. With birds costing $3.00 to rear and 75% of them promptly disappearing, each bird bagged cost $12. Cost was $24 per bird bagged when hens were not shot. In one test, 250 were released just before the 2-day season and only 131 were shot. Not one bird from the previous year's release was taken. The game department just about has the hunters persuaded to let the state stop the costly waste of stocking pen-reared pheasants.

Harper, Hugh A. (Idaho Game Dept.) BAND RETURNS FROM GAME FARM PHEASANT RELEASES IN NORTHERN IDAHO. Proc. 35th Ann. Conf. W. Assn. State Game & Fish Comms. p. 236-242. 1955.
From 6% to 36% of stocked pheasants are shot in 3 areas of n. Idaho. Few birds live to second or third hunting season. Sex ratios show that stocked cocks are not needed for breeding. In one area, the game farm birds constituted only 3.3% of those shot. In another area they furnished 65% of the kill on opening week-end. "With from 64 to 94 percent of the released game farm cocks seemingly contributing nothing, the release of game farm pheasants is an expensive operation at a cost of $2.00 to produce and release..." It would appear that (1) cocks should not be stocked where natural production yields a reasonable harvest, and that (2) birds stocked for the gun should be released in areas of high survival and heavy hunting pressure, thus minimizing cost per bird bagged.

Hart, Chester M. (Calif. Dept. Game.) PHEASANT SURVIVAL STUDIES IN CALIFORNIA. Proc. 35th Ann. Conf. W. Assn. State Game & Fish Comms. p. 246-255. 1955.
Based on 3 years of study on a 68,000-acre area in Sutter Basin. Some hen shooting was practiced, more than 8,000 pheasants were trapped, nearly 6,700 were banded, and almost 1,200 bands were returned. "Annual mortality rates evidently averaged about 80 percent for cocks, 65 percent for hens, and 70 percent for the over-all population. Non-hunting mortality of hens was believed equal to hunting mortality of cocks, at approximately 56 percent annually. Calculations of mortality rates for age groups gave somewhat inconsistent results, but indicated that survival of juveniles was appreciably lower than adult liveability. It was concluded that: (1) the cock population in Sutter Basin was underharvested, and that (2) greater benefits could be derived from the hen population by management measures to increase hen survival or by limited, but greater, harvest of hens by hunters. The latter course is being followed, with 1955 regulations for California's better pheasant areas permitting hunters to take one hen in the seasonal bag."

Klonglan, Eugene D. (Iowa State Coll.) PHEASANT NESTING AND PRODUCTION IN WINNEBAGO COUNTY, IOWA, 1954. Proc. Iowa Acad. Sci. 62: 626-637. Dec. 1955.

Summary: "1. An intensive pheasant nesting and production study was conducted in 1954 on the Winnebago Research Area in northcentral Iowa. 2. About 17 percent of the 162 nests were successful. 3. Agricultural activities accounted for 63 percent of the nest losses. Desertion, predation and flooding accounted for the rest. 4. Agricultural activities killed or severely injured 23 percent of the spring hen population. Other causes accounted for 8 percent. 5. A loss of 2.3 chicks per brood, or about 30 percent, from hatching to 9-12 weeks of age was found. 6. The fall pheasant population did not differ significantly from those of the preceding two years. A cold May apparently prevented any great increase, though a large brood stock was present."

Loughrey, A. G., and R. H. Stinson. (Can. Wildl. Serv., Ottawa.) FEEDING HABITS OF JUVENILE RING-NECKED PHEASANTS ON PELEE ISLAND, ONTARIO. Can. Field-Nat. 69(2): 59-65, graphs. Apr.-June [Dec.] 1955.

Volumetric analysis of 251 crops showed that the diet consisted almost entirely of insects for the first 3 weeks. A change occurred during 4th to 6th weeks to a diet mainly of plant material. The insects were mostly mayflies, the plant material mostly wheat. Both preference and availability appeared to play a part in the selection of food items.--L. F. Stickel.

Masson, W. V. (Ore. Game Comm.) APPLICATION OF INVENTORY DATA IN MANAGEMENT OF THE PHEASANT. Proc. 35th Ann. Conf. W. Assn. State Game & Fish Comms. p. 257-261, graphs. 1955.

Graphs are presented and discussed for Ore. data on trends in pheasant population density in spring, percentages of hens with broods, percentages of young in bag, average numbers of chicks per hen and per brood, total kill, birds shot per hour, birds per hunter, and length of hunting season. These data are studied and compared with special reference to possibility of predicting population level at hunting season. Fluctuations of spring populations tend to reach peak at 6-year intervals in Willamette Valley and Malheur Co. areas. Hunter success depends on so many variables other than game population levels that it cannot be forecast. Mid-July brood counts afford a measure of potential production. Percentage of young in bag correlates closely with percentage of hens with broods in mid-July. Combination of data on hens with broods and chicks per hen appears to give best indication of what total kill will be. Spring densities do not necessarily give such an indication. Spring densities show some relationship to production of preceding year; this seems true statewide but not locally. Size of harvest seems to have little influence on breeding population of following year.

Moore, Paul. (Ohio Div. Wildl.) WHY HYBRID PHEASANTS? Ohio Cons. Bul. 19 (12): 10-11, 29, illus. Dec. 1955.

Ohio is releasing Quintex pheasants. They are a mixture of 5 races of P. colchicus. Since their heredity is so scrambled, it is hoped that they will provide good raw material from which natural selection can develop birds suited to parts of Ohio where pheasants have not yet succeeded.

Ohio. THE REEVES PHEASANT IN OHIO. Ohio Div. Wildl., Game Survey News 3(1): 1-4, illus. Jan. 1956.

This woods pheasant is being stocked in the hill country of s. Ohio. It has survived Ohio winters and has had some reproductive success. The present leaflet reports this success, gives a little information on habits and Chinese habitat of the bird, and states that hybrids between Reeves and 5 races of ringneck will be tried.

Stokes, Allen W. (Utah State Agr. Coll.) PATTERNS OF PHEASANT HARVEST IN UTAH. Proc. Utah Acad. Sci. 32: 51-58. 1955.

Detailed hunting statistics were obtained for 2 areas near Logan where hunting was by permit only but was still heavy. Pre- and postseason sex ratios were determined. Pre- and postseason populations were calculated from hunting statistics and sex ratios. Kill of cocks was plotted for each day of the 5-day seasons, 1953 and 1954. As a yardstick for suitable kill of cocks, it was deemed safe to kill cocks until 1 cock to 20 hens remained. This level of kill was not reached. There remained 12-20 cocks per 100 hens. It therefore seems

that Utah could add a week or 2 to its 3-5 day seasons. This would be true unless illegal kill of hens rose in proportion to length of season; the facts here remain to be determined. If kill of hens did rise with length of season, an educational campaign would be called for. Data for open hunting land gave figures on cock survival similar to those for the 2 permit areas, with 25% of cocks alive after season. It is pointed out that the percentage of cocks killed tends to increase with the density of a pheasant population. In other words, the larger a pheasant population is, the larger the proportion of cocks killed is apt to be.

Westerskov, Kaj. (Wildl. Div., Wellington, N. Z.) NOTES ON THE POST-JUVENILE MOULT AND FIRST-WINTER PLUMAGE IN THE PHEASANT. Brit. Birds 48(7): 308-311. July 1955.

Summary: "Pheasants (Phasianus) attain their juvenile plumage when about five weeks old at which time the post-juvenile moult has begun; the proximal primaries are shed when the birds are 4-5 weeks old. All ten juvenile primaries are shed and replaced in contrast to most other Galliformes. The post-juvenile moult is complete and the immature Pheasant has reached its full weight when about 24 weeks old. Under field conditions young cocks of 20 weeks of age are indistinguishable from adult cocks. As all primaries are shed there is no difference in shape of tips in the two distal primaries in immature and adult birds."

Westerskov, Kaj. (Wildl. Div., Wellington, N. Z.) PRODUCTIVITY OF NEW ZEALAND PHEASANT POPULATIONS / A STUDY OF THE PHEASANT, PHASIANUS COLCHICUS, UNDER NEW ZEALAND CONDITIONS, ITS REPRODUCTIVE CAPACITY, TAXONOMY, DISTRIBUTION, AND MANAGEMENT. Ph.D thesis, Victoria U. Coll., U. of New Zealand. xiv + 631 p., 72 figs. June 1955.

GROUSE, PARTRIDGE, ETC.

Bailey, William J., Jr., Ward M. Sharp, Robert B. Hazel, and Grant Davis. (Pa. St. U.) FOOD HABIT TRENDS OF RUFFED GROUSE IN THE CENTRE COUNTY "BARRENS" (BASED ON DROPPINGS ANALYSIS). Pa. St. U., Agr. Exp. Sta., Bul. 604. 1-18 p., 6 graphs. Oct. 1955.

2,517 droppings were analyzed for fall and winter seasons 1948-49, 1952-53 and 1953-54. The investigation was conducted on the Barrens 1,468-acre study area in Centre Co., Pa. Droppings were collected periodically from known drumming sites, with a minor quantity from snow roosts. Aspen buds, acorns, teaberry fruit, miscellaneous leaves, and wild grapes were leading food items. Collection of droppings allowed one to follow food preferences of individual birds. Aspen buds furnished the bulk of winter bud diet. These buds rate high in crude protein and ether extract--higher, in fact, than white oak acorns.--Ward M. Sharp.

Doll, A. D. (Wis. Cons. Dept., Park Falls.) SHARPTAILED GROUSE MANAGEMENT: PROGRESS REPORT. Wis. Cons. Bul. 20(12): 21-23, illus. Dec. 1955.

Ten areas totaling 65,000 acres are being managed for sharptails in Wis. and prospects for more such areas are good. Management usually calls for opening up trees and brush by fire, cutting, bulldozing, herbiciding and other means. In some habitats, more brush is needed and is obtained by cutting scrub aspen growth. Where summer food is short, small fertilized food patches are used. Some cleared areas are seeded to grasses and legumes. Operations are costly but effects of some of them last for many years.

Hatter, J. (B. C. Game Comm.) PROBLEMS IN THE MANAGEMENT OF SOOTY GROUSE IN BRITISH COLUMBIA. Proc. 35th Ann. Conf. W. Assn. State Game & Fish Comms. p. 262-265. 1955.

Logging and slash burning lead to large populations of sooty (blue) grouse on Vancouver Is., less so on mainland. Effects last less than 15 years. Average brood in July is 3 or 4, but variation from place to place and year to year is reported here. Wet weather in hatching and rearing season is considered depressing factor. Individuals of all groups move up mountains and away from hunters in late summer. Adult ♂♂ go early and few are shot. Hunting must begin

before ♀♀ and young also leave but after young are big enough to bag and after worst fire danger is over. This leaves only a week or two in early Sept. for substantial hunting. Migration is so early and escapement is so great that harvests are small in some years. Bendell found that hunting contributes little to the 31% turnover in adult hens. Although brunt of hunting falls on ♀♀, sex ratio on breeding grounds is 1.6 ♀♀ per ♂. This is true despite average kill of 61,000 sooty grouse on Vancouver Is. Bendell found parasites of chicks to be a major population factor, so heavier hunter harvest seems desirable. Increased kill probably can be attained only by higher bag limit, which is already 6 per day.

Lehmann, V. H. (629 W. Lee, Kingsville, Texas.) THE PRAIRIE CHICKEN--WHERE NEXT? Texas Game & Fish 14(1): 6-7, 26, illus. Jan. 1956.

"The Attwater's prairie chicken dies on the installment plan--and another fifteen years of grace is not anticipated." Major and minor colonies have dwindled and disappeared. "Over-all decline since the late 1930's has been from about 8,700 to about 3,550 birds." The decline is traced almost colony by colony and needs of the birds are outlined. Habitat changes seem to have doomed the bird, but they also show what would be necessary to save it.

TURKEY

Lee, Levon. (N. M. Dept. Game.) WILD TURKEY RESTORATION AND RANGE EXPANSION IN NEW MEXICO. Proc. 35th Ann. Conf. W. Assn. State Game & Fish Comms. p. 223-225. 1955.

Transplanting of wild stock has restored turkeys to practically all their original range in N. M. The Rio Grande turkey (intermedia) has entered ne. N. M. from transplants made in Texas and it seems that the race mexicana is still represented in sw. N. M. Most of the range is occupied, as originally, by merriami. Turkeys in N. M. began a marked increase in 1950 and are still doing well despite some local declines. Many populations probably are at carrying capacity. Number in state is estimated at around 30,000 and annual kill is about 2,000.

DOVES AND PIGEONS

Dodson, Monte M. (Okla. Game Dept.) OKLAHOMA MIGRATORY GAME BIRD STUDY 1949-1953. PART II. MOURNING DOVE STUDY. Okla. Game & Fish Dept. p. 28-51, illus. No date. Received Dec. 1955.

During 1950-53, birds were counted by roadside census; results coincided with fluctuations found in selected areas used for nesting and banding studies. Peak populations occurred in Aug. Banded young dispersed rapidly from their nesting areas. Nest mortality was 85% in shelterbelt and wilderness areas, 50% in human-occupied areas. Predators, songbird associates, and weather are discussed as factors in nesting success. Nesting peak was in July; renesting was common. An annual shelterbelt production of 8000 doves is estimated. Hunter success was determined by the double-postcard questionnaire; the major take occurred in first 10 days of season. Hunting success is believed to be more closely related to nesting success in more northern states than to Okla. production. The most devastating factor in dove depletion has been the wheat farming practice of summer fallowing instead of leaving the stubblefields until Sept.--L. F. Stickel.

Gallizioli, Steve. (Ariz. Game Dept.) HUNTING SEASON INFORMATION ON THE MOURNING AND WHITEWING DOVES OF ARIZONA. Proc. 35th Ann. Conf. W. Assn. State Game & Fish Comms. p. 226-235, graphs. 1955.

Dove hunting in Ariz. is largely confined to s. counties. Use of collection boxes and signs on suitable roadsides was best way to get wings and hunt data. Hunter success over 4 years was 3.3 to 4.2 doves per man hour, av. 3.7. Despite 40-day season, over 90% of kill was in first 12 days. Band returns during first year were only 1.3% for mourning doves and 0.7% for whitewings. In 1951, some 29% of hunters hunted doves and they bagged an estimated 420,000 mourning doves and 92,000 whitewings. Most whitewings migrate s. out of state before

hunting is legal in Sept. Only 45.8% of doves bagged in Ariz., 1953, were young; average for 20 states was 67.3% young. Month of peak production is July or Aug., depending on year. "Recommendations for increasing whitewing and mourning dove harvest included an early experimental whitewing only hunt, larger bag limits and a split dove season."

Swank, Wendell George. (805 W. State Ave., Phoenix, Ariz.) CONTRIBUTIONS TO THE KNOWLEDGE OF THE LIFE HISTORY AND ECOLOGY OF THE MOURNING DOVE IN TEXAS. Ph.D. thesis, A & M Coll. Texas. 157 p., illus. 1952. [Copy in US Dept. Int. Library.]

See WR 68: 33 and WR 82: 35-36.

WATERFOWL

Baldwin, William P. (Summerville, S. C.) FOOD SUPPLY KEY TO ATTRACTING DUCKS. S. C. Wildl. 3(1): 5-12, illus. Winter 1956.

This article by a recognized authority on the subject in the SE. provides useful information for duck hunters and waterfowl technicians. Besides discussing the important role of food plants in making S. C. marshes and ponds attractive to ducks, it includes 4 pages of illustrations of desirable and undesirable plants, a table classifying desirable and undesirable plants in different types of habitats, and a brief discussion of management practices in three major types of habitat: "Coastal saline habitat," "fresh river delta," and "swamp and upland ponds."--A. C. Martin.

Bellrose, Frank C., and Thomas G. Scott. (Ill. Nat. Hist. Surv.) WATERFOWL CONSERVATION IN THE DECADE FOLLOWING WORLD WAR II. Wilson Bul. 67(4): 310-312. Dec. 1955.

Report of the Wilson Ornith. Soc. Cons. Com. Primarily a brief, critical evaluation of hunting regulations, use of duck stamp funds, depredation problems, and drainage inroads, together with notes on research progress. Authors feel that regulations are dangerously liberal and that flyway councils should make welfare of waterfowl a primary concern.

Cowan, Archibald B. (Patuxent Refuge, Laurel, Md.) THE DEVELOPMENT OF MEGALOSCHIZONTS OF LEUCOCYTOZOON SIMONDI MATHIS AND LEGER. J. Protozool. 2(4): 158-167, 12 figs. Nov. 1955.

Detailed contribution to knowledge of life history of an important parasite of waterfowl.

Dodson, Monte M. (Okla. Game Dept.) OKLAHOMA MIGRATORY GAME BIRD STUDY 1949-1953. PART I. WATERFOWL STUDY. Okla. Game & Fish Dept. v + 27 p., illus. No date. Received Dec. 1955.

During 1950-52, birds were counted by aerial survey and reports of cooperators. Fall peaks of geese and coots came in Oct. and of ducks in Nov. Inclusion of dates Oct. 20 to Nov. 30 in open season is recommended for maximum hunter success. Spring migration reached its peak Feb.-Mar. with species moving through in reverse order from fall. A longer stay of migrating birds in spring than in fall is attributed to lack of hunting pressure. Wintering populations averaged approximately 100,000 ducks and 10,000 geese. A limited amount of waterfowl nesting occurred. Included also is distribution of migrating groups in the state, description of type of habitat favored, banding program techniques (including use of electric fences to discourage raccoons), species and sex ratios in banding operations, hunting success (double-postcard questionnaire technique is recommended), and management recommendations (primarily upland food plantings near reservoirs).--L. F. Stickel.

Dresser, Cleveland van. THE GOOSE HANGS HIGH. Am. Forests 61(12): 28-29, 59-60, illus. Dec. 1955.

What the states and federal government are doing to establish new breeding colonies of Canada geese in the U. S. and how they are going about it.

Hochbaum, H. Albert. TRAVELS AND TRADITIONS OF WATERFOWL. U. Minn. Press. xii + 300 p., illus. 1955. $5.00, cloth.

From the author's preface: "Part I is...an analysis of the movements of waterfowl on their home range on the Delta Marsh...migration is discussed in Part II." In Part III the author draws upon explanations and examples to indicate that in at least "some species the route of migration is handed down through tradition." The first part of this book is devoted to analysis of local movements in which environmental influences and hereditary factors guide the daily pattern of activity. In the second part the author attempts to demonstrate with experimental and observational evidence those factors most important in causing waterfowl to migrate and in guiding them to their distant destinations. The final section involves a philosophical treatment of "traditions" of waterfowl as they affect habits, speciation, distribution and survival. The book has a bibliography of nearly 24 pages.--Ray C. Erickson.

Kuroda, N. A LIST OF PHOTOGRAPHS OR DRAWINGS OF MALE DUCKS IN THEIR ECLIPSE PLUMAGES. Annot. Zool. Jap. 28: 48-51. 1955. [From Auk 72(4).]

Miller, A. W. (Calif. Dept. Game.) WHAT DO SACRAMENTO VALLEY DUCKS EAT? Outdoor Calif. 16(12): 9, 2 graphs. Dec. 1955.

Based on study of 343 mallard and 345 pintail gizzards. Major foods are graphed for months from Aug. through April and are discussed in relation to management. "The studies tend to show that ducks are not especially a threat to rice until it starts ripening in late September, and that the critical period for keeping the birds in the refuges and off the crops is immediately prior and during the rice harvest itself."

Reilly, James R. (N. Y. Cons. Dept.) SOME ASPECTS OF LEUCOCYTOZOAN INVESTIGATIONS IN NEW YORK. N. Y. Fish & Game J. 3(1): 114-119. Jan. 1956.

Abstract: "Mallard ducklings exposed to blackflies in the presence of known carriers of the parasite became infected with Leucocytozoon simondi. Exposure of 3-day-old ducklings to a relatively limited source of infection produced a slowly developing low-grade parasitemia in 55.9 per cent of the specimens in 34 days. In a group of 5-week-old birds, exposed after a greater source had built up, an infection of 62.5 per cent developed in 12 days and resulted in the death of one individual. The pathology is described for this case. The clinical symptoms are also given. The relapse phenomenon was evident with the incidence of infection in blood films dropping to a low of 11.5 per cent in December and increasing to 41.8 per cent the following spring."

Ryder, Ronald A. (Colo. Game Comm.) A PRELIMINARY ANALYSIS OF WATERFOWL RECOVERIES IN COLORADO WITH NOTES ON TRAPPING AND BANDING. Colo. Game & Fish Comm., Completion Rep. Proj. W-37-R. ix + 72 p. mimeo. + 28 figs. July 1955.

Analysis of some 10 years of banding work. Chief species treated here are mallard, Canada goose, pintail, and baldpate. A little information is given for other species. Text, 63 tables, and numerous maps show where birds banded in Colo. were shot, effect of season of banding on recoveries, sources of birds shot in Colo. after being banded elsewhere, sex ratios before and after hunting season, mortality rates for age groups, wintering populations in Colo. localities, hunting pressure as indicated by band recoveries, etc. One section gives some new information on the crucial question of the proportion of bands that is reported by hunters.

Schiller, Everett L. (Arctic Health Res. Center, Anchorage, Alaska.) STUDIES OF THE HELMINTH FAUNA OF ALASKA. XVIII. CESTODE PARASITES IN YOUNG ANSERIFORMES ON THE YUKON DELTA NESTING GROUNDS. Trans. Am. Micros. Soc. 73(2): 194-201, 6 figs. Apr. 1954.

Schiller, Everett L. (Arctic Health Res. Center, Anchorage, Alaska.) STUDIES ON THE HELMINTH FAUNA OF ALASKA. XXIII. SOME CESTODE PARASITES OF EIDER DUCKS. J. Parasit. 41(1): 79-88, 18 figs. Feb. 1955.

Webster, Clark G. (Patuxent Refuge, Laurel, Md.) HATCHING OF WOOD DUCK EGGS AFTER ABANDONMENT. Wilson Bul. 67(4): 306. Dec. 1955.

Several eggs hatched in a nest box, during warm summer temperatures, without evident benefit of parent bird.

WATERFOWL--Continued

Wingfield, Billy, and Jessop B. Low. (Utah State Agr. Coll.) WATERFOWL PRODUCTIVITY IN KNUDSON MARSH, SALT LAKE VALLEY, UTAH. Proc. Utah Acad. Sci. 32: 45-49. 1955.

Based on 738 nests of mallard, cinnamon teal, redhead, and ruddy duck. There were 5.3 nests per acre of vegetation. Hardstem bulrush was used for 64.9% of nests, Olney's bulrush for 29.7%. These bulrushes were used for nesting in about the proportion in which they occurred. A high of 17.9 mallards was hatched per acre of hardstem bulrush as compared with 14.4 mallards from Olney's bulrush. Hardstem bulrush was most important cover type for hatching of mallards and redheads. Olney's was most important for hatching of cinnamon teal. Cattail was most important for ruddy duck. "On the 174 acre Knudson Marsh there was a known production (hatch) of 2606 young ducks in the 1950 season, or 14.9 young for each acre. Mallard produced 9.8 young, cinnamon teal 1,8, redhead 2.7, and ruddy duck 0.6 young ducklings for each acre."

Yocom, Charles F., and William A. Wooten. (Humboldt State Coll.) BLUE-WINGED TEAL IN DEL NORTE COUNTY, CALIFORNIA. Calif. Fish & Game 42(1): 81. Jan. 1956.

Believed to be first breeding record for nw. corner of Calif. Habitat is described.

CRANES, RAILS, SHOREBIRDS

Walkinshaw, Lawrence H., and Harold F. Wing. (1703 Wolverine-Federal Tower, Battle Creek, Mich.) CENSUSING SOUTHERN MICHIGAN SANDHILL CRANES. Auk 72(4): 374-384, illus. Oct. 1955.

Cooperative census 1952-4 showed spring numbers of 158, 156 and 149, about 60 per cent of them breeders. The same number of young (39) was produced each year. Counts of fall concentrations helped verify summer census results. Cranes probably pair during their 3d summer and may not nest until 4 yrs. old. Survey methods are described.--L. F. Stickel.

OTHER BIRDS

Betts, Monica M. (Ed. Grey Inst., U. Oxford, Eng.) THE FOOD OF TITMICE IN OAK WOODLAND. J. Anim. Ecol. 24(2): 282-323, 4 figs. Nov. 1955.

Food habits of 4 sp. of titmice living in oak woodland were studied by gizzard analysis of specimens collected each month for 1 year. Diets of different sp. differed, as did principal microhabitats in which they sought food. Beaks were adapted to sizes and types of food taken, enabling all to feed in the same areas without necessarily competing for food. Foods brought to nestling great and blue tits reflected differences in adult foods. Nestling great tits received larger food items than did blue tits, and further, food size increased as young grew. Estimates of amount of predation by titmice on defoliating caterpillars did not suggest a controlling influence, though the proportional depletion of adult winter moths was higher and might be important.--L. F. Stickel.

DuMont, Philip A. (US F&WS.) MANAGEMENT OF BIRDS ON AIRPLANE RUNWAYS. Atlantic Nat. 11(3): 108-114, 9 figs. Jan.-Feb. 1956.

Report of studies of albatrosses and other sea birds on Midway Islands. Material is similar to that published in Natl. Parks Mag. for Apr.-June 1955 and abstracted in WR 81: 52.

Fehon, Jack Harold. LIFE-HISTORY OF THE BLUE-GRAY GNATCATCHER (POLIOPTILA CAERULEA CAERULEA). Ph.D. thesis, Fla. St. U. 88 p. 1955. [From long abstract in Dissertation Abstracts 15(11).]

Mewaldt, L. Richard. (San Jose State Coll., Calif.) NESTING BEHAVIOR OF THE CLARK NUTCRACKER. Condor 58(1): 3-23, 4 figs. Jan.-Feb. 1956.

Pfitzenmeyer, H. T. (Pa. State U.) WOODPECKERS VS. SCIENTISTS. N. Y. State Cons. 10(4): 6-8, illus. Feb.-Mar. 1956.

Tells of the great damage pileated woodpeckers do to perfectly sound utility poles in some areas, and of research attempts to minimize this damage. Even newly installed, creosoted poles that have not yet been wired (and which therefore cannot be humming as if insect-infested) may be injured. Chemical, physical, and visual repellents are being tried.

REPTILES AND AMPHIBIANS

Carr, Archie. (U. Fla.) THE WINDWARD ROAD / ADVENTURES OF A NATURALIST ON REMOTE CARIBBEAN SHORES. Knopf, N. Y. xvi + 258 + viii, 20 figs. 1956. $4.50.

Dr. Carr is the rare zoologist who sees things with the spirit of the artist, the interests of the humanist, the ardor of the incurable naturalist, and tells about them with an intriguing style and quiet but irresistable humor. One would not have expected from the author of those technical references, The Herpetology of Florida and the Handbook of Turtles, such books as High Jungles and Low and the present book, which is even more enjoyable. Here you travel with him to little-known beaches of the Caribbean in search of information on sea turtles, especially the endangered green, whose conservation was the main reason for Carr's trips. You learn much that is not in reference books about the breeding, migrations, and hunting of sea turtles. But the book is mainly about the fascinating places that Carr went, and even more about the almost incredible characters and peoples whom he met. You will not forget the sloths in the city park, the Chinese merchant who treasured his fattened testudos, or the weekly debauches of the Mosquito tribe. You will chill with the author as the native bush pilot lands his patched-up plane on a dog-leg course amongst logs on the beach. You will puzzle with Carr over the mystery of the ridley, which has not been known to breed and which has not even been found with eggs, and you will wonder with him what sort of international agreement could protect the green turtle as a resource. But most of all you will remember the obscure, picturesque villages, wonderful foods, and unlikely individuals of all colors that Carr describes in his unhurried and often hilarious vignettes. [Two chapters, The Riddle of the Ridley and The Passing of the Fleet, have been published in journals and abstracted in WR 83: 58 and 78: 71.]

Clarke, Robert. (Kans. State Teach. Coll. of Emporia.) OBSERVATIONS ON EUMECES S. SEPTENTRIONALIS IN KANSAS. Herpetologica 11(3): 161-164. Nov. 1955.

Range, habitats, hibernating sites, eggs.

Clay, William M., Roberta B. Case, and Robert Cunningham. (U. Louisville.) ON THE TAXONOMIC STATUS OF THE SLIMY SALAMANDER, PLETHODON GLUTINOSUS (GREEN), IN SOUTHEASTERN KENTUCKY. Trans. Ky. Acad. Sci. 16(3): 57-65, graphs. Aug. 1955.

Variation in certain samples of P. glutinosus is analyzed in detail. As a result, P. kentucki is synonymized with glutinosus. [The paper is of special interest in providing another good example of how excessively and unreliably some of the eastern salamanders have been split up.]

Crenshaw, John Walden, Jr. THE ECOLOGICAL GEOGRAPHY OF THE PSEUDEMYS FLORIDANA COMPLEX IN THE SOUTHEASTERN UNITED STATES. Ph.D. thesis, U. Fla., 211 p. 1955. [From Dissertation Abstracts 15(11)].

Includes several taxonomic changes.

Crenshaw, John W., Jr. (U. Mo.) THE LIFE HISTORY OF THE SOUTHERN SPINY LIZARD, SCELOPORUS UNDULATUS UNDULATUS LATREILLE. Am. Midl. Nat. 54(2): 257-298, illus. Oct. 1955.

Lizards were captured, marked, and released in two special study areas in sw. Ga. The populations are described as to age and sex ratios, measurements, color, and scutellation. With the aid of laboratory observations, life history data were obtained on egg size, clutch size, pre-oviposition period, time of egg laying, the nest, incubation period, hatching, and age at sexual maturity. Growth and growth rates during the annual cycle are given particular emphasis. Growth data were obtained from successive measurements of recaptured individuals. Rates of regenerative tail growth were apparently determined by the proportionate length of the lost section. The maximum ecological life expectancy was about 3 years, the average less than 6 months.--L. F. Stickel.

Cunningham, John D. (U. Calif., Los Angeles.) ARBOREAL HABITS OF CERTAIN REPTILES AND AMPHIBIANS IN SOUTHERN CALIFORNIA. Herpetologica 11(3): 217-220. Nov. 1955.

Dessauer, Herbert C. (La. State Sch. Med., New Orleans.) EFFECT OF SEASON ON APPETITE AND FOOD CONSUMPTION OF THE LIZARD, ANOLIS CAROLINENSIS. Proc. Soc. Exp. Biol. & Med. 90(2): 524-526, graph. Nov. 1955.
Summary: "Food consumption of adult male lizards...at 28°C is maximal in summer and minimal in winter. This seasonal variation in appetite appears to be correlated with hours of daylight and is responsible in part for seasonal changes in body composition of this lizard."

Duellman, William E. (U. Mich.) NOTES ON REPTILES AND AMPHIBIANS FROM ARIZONA. U. Mich., Occ. Pap. Mus. Zool. no. 569. 1-14 p. + 1 pl. Aug. 1955.
Annotated list gives data on variation, distribution, and taxonomy.

Dunlap, Donald G. (State Coll. Wash.) INTER- AND INTRASPECIFIC VARIATION IN OREGON FROGS OF THE GENUS RANA. Am. Midl. Nat. 54(2): 314-331, illus. Oct. 1955.
Detailed study of identification and distribution.

Edgren, Richard A., and Margery K. Edgren. (G. D. Searle and Co., P. O. Box 5110, Chicago 80, Ill.) THERMO-REGULATION IN THE MUSK TURTLE, STERNOTHERUS ODORATUS LATREILLE. Herpetologica 11(3): 213-217, graph. Nov. 1955.

Fitch, Henry S. (U. Kans.) AN ECOLOGICAL STUDY OF THE COLLARED LIZARD (CROTAPHYTUS COLLARIS). U. Kans. Publ., Mus. Nat. Hist., 8(3): 213-274, 4 plates, 10 figs. Feb. 1956.
Another fine monograph based on the author's years of work at the U. Kans. Nat. Hist. Reservation. Section headings include: habitat, seasonal activity, temperature, reproduction, growth, regeneration and recovery from injury, molt, numbers, territoriality, food habits, predation, and parasites.

Fitch, Henry S. (U. Kans.) A FIELD STUDY OF THE KANSAS ANT-EATING FROG, GASTROPHRYNE OLIVACEA. U. Kans. Publ., Mus. Nat. Hist., 8(4): 275-306, 9 figs. Feb. 1956.
Good monograph that treats habitat, behavior, temperature relationships, breeding, development and growth, color and pattern, movements, food habits, predation. The study is based on 1,215 individuals and 6 years of work. Like all of Fitch's papers, this one contains a great deal of substantial information.

Fouquette, M. J., Jr., and H. L. Lindsay, Jr. (U. Texas.) AN ECOLOGICAL SURVEY OF REPTILES IN PARTS OF NORTHWESTERN TEXAS. Texas J. Sci. 7(4): 402-421. Dec. 1955.
Annotated list based on 846 specimens of 31 species. Includes taxonomic, distributional, and ecological notes.

Hamilton, W. J., Jr. (Cornell U.) NOTES ON THE ECOLOGY OF THE OAK TOAD IN FLORIDA. Herpetologica 11(3): 205-210. Nov. 1955.
Numbers, home range, growth, food habits, parasites.

Hudson, Robert G. (NE. High School, Philadelphia, Pa.) OBSERVATIONS ON THE LARVAE OF THE SALAMANDER EURYCEA BISLINEATA BISLINEATA. Herpetologica 11(3): 202-204. Nov. 1955.
Size distribution, behavior, habitat preference, time of metamorphosis.

Jameson, David L. (U. Ore.) THE POPULATION DYNAMICS OF THE CLIFF FROG, SYRRHOPHUS MARNOCKI. Am. Midl. Nat. 54(2): 342-381, 2 figs. Oct. 1955.
Mark and release studies were made in special areas to determine home range size and population densities. Several habitats were compared. Experimental depopulation in one area resulted in ingress of frogs from the area surrounding. Dispersal after introductions in another area is reported. Various other aspects of life history and ecology include: weather in relation to activity, habitat preferences, foods, breeding season, breeding behavior, growth, survival, and juvenile dispersal. Morphological variation was analysed in specially collected samples and geographic variation is discussed.--L. F. Stickel.

Karlstrom, Ernest L., and Robert L. Livezey. (MVZ, U. Calif., Berkeley.) THE EGGS AND LARVAE OF THE YOSEMITE TOAD BUFO CANORUS CAMP. Herpetologica 11 (3): 221-227, illus. Nov. 1955.
Includes comparisons with eggs and larvae of B. boreas halophilus.

Korshgen, Leroy, and Don L. Moyle. (Mo. Cons. Comm.) FOOD HABITS OF THE BULLFROG IN CENTRAL MISSOURI FARM PONDS. Am. Midl. Nat. 54(2): 332-341, 1 fig. Oct. 1955.
Principal foods by months and detailed overall food analysis based on examination of 455 stomachs.

Oliver, James A. THE NATURAL HISTORY OF NORTH AMERICAN AMPHIBIANS AND REPTILES. Van Nostrand, Princeton, N. J. x + 359 p., 74 figs., 12 plates. 1955. $6.95.
Dr. Oliver, Ditmars' able successor in the N. Y. Zoological Society, has written this book for the naturalist and the beginning student of amphibians and reptiles. The book is suitable for any seriously interested person past grade-school level. Like Hamilton's "American Mammals," it is organized by biological topics rather than by systematic groups. Material is readable, up-to-date, authoritative, and ecologically oriented. Oliver does not attempt to tell all that is known about reptiles and amphibians of U. S. and Canada, but he does tell a great deal and what he tells is what the naturalist wants to know. Documentation is not provided, but authors' names are mentioned freely in connection with their work. Glossary and index are included. Chapter headings give a fair idea of the book's scope: Folklore; Economic values; Classification; North American amphibians; North American reptiles; Occurrence of amphibians and reptiles; Locomotion and movements; Activity; Relation to environment; Food and feeding; Reproduction; Growth, size, and longevity; Amphibians and reptiles as pets. Under these headings Oliver gives a rich sampling of the extensive herpetological research of recent years. The book is not designed to be a handbook for identification. It is an excellent source of general information presented in such a way that it is available and useful to anyone who wants it, regardless of the amount of his scientific training.

Vernberg, F. John. (Duke U.) CORRELATION OF PHYSIOLOGICAL AND BEHAVIOR INDEXES OF ACTIVITY IN THE STUDY OF PLETHODON CINEREUS (GREEN) AND PLETHODON GLUTINOSUS (GREEN). Am. Midl. Nat. 54(2): 382-393, 4 figs. Oct. 1955.

Williams, R. Winston. (U. Okla. Med. Sch.) HELMINTHS OF THE SNAPPING TURTLE, CHELYDRA SERPENTINA, FROM OKLAHOMA, INCLUDING THE FIRST REPORT AND DESCRIPTION OF THE MALE OF CAPILLARIA SERPENTINA HARWOOD, 1932. Trans. Am. Micros. Soc. 72(2): 175-178, 2 figs. Apr. 1953.

NEW OUTLINE OF WILDLIFE REVIEW

A new arrangement of entries is being tried in this issue. Its chief advantage is that it permits more natural grouping of certain sorts of entries. Change is greatest in sections now listed under "Management and ecology of habitats and animals." Previously it was necessary to list some papers under "Wildlife--Management" and closely related papers under "Vegetation." Results were not satisfactory and consistency was not achieved.

A complete outline of the new system is presented in the table of contents although there are no entries under some headings in this issue.

Text for the following pages (44-57) was completed before the new arrangement was decided on. It therefore follows the old arrangement except for minor changes made to fit the material.

TITLES SELECTED FROM ZOOLOGICHESKII ZHURNAL, 1947-1954.

The following list of titles from the Zoologicheskii Zhurnal (Revue Zoologique Russe, Moscow) has been provided by Dr. Robert S. Hoffmann, Department of Zoology, Montana State University, Missoula. Dr. Hoffmann translated selected titles from issue number 5 of 1947, when the practice of publishing English summaries was stopped, through 1954. Titles selected for translation were those of interest to vertebrate zoologists except that titles pertaining to physiology and to cold-blooded vertebrates usually were omitted. We recognize that certain titles in the list have little connection with game biology. For maximum bibliographic value, however, it seems best to present Dr. Hoffmann's complete list.

We have arranged the entries by subject approximately as ordinarily done in Wildlife Review. It is interesting to note the virtual absence of references to hunting and game animals and the prevalence of papers on the sense organs of rodents, tularemia, corvid birds, and the economics of birds.

Locations of full translations of two papers on populations dynamics are indicated under WILDLIFE--NUMBERS AND NUMBER FLUCTUATIONS and MAMMALS--COMMUNITIES, NUMBERS, HOME RANGES.

WILDLIFE--BIBLIOGRAPHY, BIOGRAPHY, HISTORY

ZOOLOGICAL LITERATURE OF THE U.S.S.R.--PRE-EMINENTLY FOR 1946. Zool. Zhur. 27(3): 265-303.
Includes sections on the following subjects: General ecology and biocenology. Terrestrial biocenoses. General zoogeography and faunistics. Fauna injurious to plants. Amphibians and reptiles. Birds. Mammals.

WILDLIFE--NATURAL AREAS AND REFUGES

Nasimovich, A. A., and V. A. Arsenev. ACCOUNT OF ZOOLOGICAL INVESTIGATIONS ON MAMMALS AND BIRDS IN PRESERVES OF THE U.S.S.R. Zool. Zhur. 26(5): 465-480. 1947.

WILDLIFE--MORPHOLOGY, PHYSIOLOGY, BEHAVIOR, MIGRATION

Danilova, E. I., and A. I. Sviridov. SIZE AND OSSIFICATION OF SKELETAL EXTREMITIES IN CONDITIONS OF EXPERIMENTAL ALTERATION OF LOAD. Zool. Zhur. 32 (4): 780-786. 1953.

Dement'ev, G. P. INVESTIGATIONS ON THE COLOR OF VERTEBRATE ANIMALS. Zool. Zhur. 27(1): 47-52. 1948.

Matsko, S. N., and A. T. Zhmeido. PROCESS OF ICE FORMATION AND PECULARITIES OF THE TEMPERATURE CURVE OF THE BODY OF VERTEBRATES AROUND THE FREEZING POINT. Zool. Zhur. 28(3): 269-276. 1949.

Pavlinin, V. N., and S. S. Shwartz. EXPERIMENT ON THE ECOLOGICAL ASSESSMENT OF THE ACTION OF STARVATION ON ANIMALS. Zool. Zhur. 30(6): 620-628. 1951.

WILDLIFE--BIOTAS, COMMUNITIES, GENERAL ECOLOGY

Florov, D. N. ON THE ZOOGEOGRAPHICAL SIGNIFICANCE OF THE PERMAFROST. Zool. Zhur. 31(6): 875-882. 1952.

Gilyarov, M. S. SPECIES, POPULATIONS AND BIOCENOSES. Zool. Zhur. 33(4): 769-778. 1954.

Kolesnik, N. N. BERGMANN'S RULE IN GEOGRAPHIC VARIATION OF DOMESTIC ANIMALS. Zool. Zhur. 27(5): 389-402. 1948.

Teplova, E. N. ON NEW ZOOLOGICAL FINDINGS IN THE REGION OF PECHORO-ILICHSK STATE PRESERVE. Zool. Zhur. 32(5): 1027. 1953.

Vereshchagin, N. K. DEPOSITION OF REMAINS OF LATE PLEISTOCENE ANIMALS AND PLANTS NEAR THE VILLAGE OF LOWER [NIZHNIE] KARMALK IN SOUTHERN TATARSK A.S.S.R. Zool. Zhur. 32(5): 999-1013. 1953.

WILDLIFE--NUMBERS AND NUMBER FLUCTUATIONS

Kalabukhov, N. I. DYNAMICS IN NUMBERS OF TERRESTRIAL VERTEBRATES. Zool. Zhur. 26(6): 503-520. 1947. [Translation by R. S. Hoffmann has been placed in office of Section of Distribution of Birds and Mammals, US F&WS, Room 61, U. S. Natl. Mus. It is available on interlibrary loan through Dept. Interior Library, Wash. 25, D. C.]

A review paper in which fluctuations are discussed with primary reference to work of Soviet biologists. Principal causes of mortality are lack of food, disease, and predation. Climatic factors ordinarily act indirectly, as by influencing food supply and stimulating reproductive cycles. Mass increases of rodents in agricultural areas may follow changes that produce unusually favorable conditions such as grain fields, meadows, gardens, and certain war-torn areas. In certain favorable habitats (semi-desert and mountain forests, for example), numbers remain about the same from year to year and fluctuate only seasonally. In other habitats, periodic fluctuations occur at 3-5 and 10-11 year intervals. In the tundra, a 3-4 year cycle occurs in nearly all species. In the taiga, periodicity of crops of berries and conifer seeds affects fluctuations of rodents, gallinaceous birds, squirrels and predators. Abundance of squirrels fluctuates with the food crop, which is favorable every 2-3, 4-5, or 8-10 years, depending on the area. Different species of rodents do not always increase in numbers at the same time in any one area. The pattern for a single species is not necessarily the same in different habitats. Seasonal differences also exist, especially between hibernating small mammals, which reach peak densities in spring, and non-hibernators, which reach peak numbers in fall. Increases are usually the result of local production rather than mass movements. Author emphasizes importance of the biocenosis as an indivisible whole. He concludes that the numbers of a species depend on a complex of interacting factors, including earlier numbers of the species, numbers of individuals of competing species, predators, disease, and climatic factors.--R. S. Hoffmann and L. F. Stickel.

Vereshchagin, N. K. CONDITIONS OF MASS DESTRUCTION OF TERRESTRIAL VERTEBRATES AND THE PRESERVATION OF THE REMAINDER IN TRANS-CAUCASIA. Zool. Zhur. 30(6): 616-619. 1951.

WILDLIFE--PARASITES AND DISEASES

Dubinin, V. B. DEPENDENCE OF DISTRIBUTION OF PARASITIC WORM LARVAE IN FISH OF THE VOLGA DELTA ON CHANGES IN PLACES OF BIRD CONCENTRATION. Zool. Zhur. 28 (2): 131-136. 1949.

Ter-Vartanov, V. N., V. M. Gusev, N. N. Bakeev, N. F. Labunetz, A. A. Guseva, and P. A. Reznik. ON THE QUESTION OF TRANSFER BY BIRDS OF MAMMALIAN ECTOPARASITES. Zool. Zhur. 33(5): 1116-1125. 1954.

Zasukhin, D. N., and S. G. Vasina. TOXOPLASMOSIS (A SURVEY). Zool. Zhur. 33(6): 1410-1419. 1954.

WILDLIFE--MORTALITY FROM INSECTICIDES, WEATHER, CARS, ETC.

Kadochnikov, N. P. ON THE INFLUENCE OF CHEMICAL TREATMENT OF A PROTECTED FOREST AREA ON BIRDS. Zool. Zhur. 30(3): 207-210. 1951.

WILDLIFE--MANAGEMENT--PREDATION, CROP DAMAGE, AND CONTROL

Deksbakh, N. K. ENEMIES OF FISH IN PONDS IN SVERDLOVSK PROVINCE. Zool. Zhur. 33(5): 1111-1116. 1954.

MAMMALS--GENERAL

Borodin, S. P. ROLE OF THE SPRING "PAVODKA" [?] IN THE MAMMALS OF A SPECIFIC BIOTOPE. Zool. Zhur. 30(6): 607-615. 1951.

Kalabukhov, N. I., and N. M. Ladigina. THE ORIGIN OF ECOLOGO-PHYSIOLOGICAL CHARACTERISTICS IN MAMMALS UNDER THE INFLUENCE OF THE EXTERNAL ENVIRONMENT. Zool. Zhur. 32(2): 294-299. 1953.

Kas'yanenko, V. G. PARTIAL [?] PHYSIOLOGY OF ORGANS OF MOVEMENT IN MAMMALS AS ONE OF THE ACTUAL PROBLEMS OF COMPARATIVE MORPHOLOGY. Zool. Zhur. 32(4): 749-755. 1953.

Leshchinskaya, E. M. SEASONAL CHANGES IN THE SKIN OF MAMMALS. Zool. Zhur. 31(3): 434-442. 1952.

Manzii, S. F. THE QUESTION OF EVOLUTION OF THE WRIST IN MAMMALS. Zool. Zhur. 32(4): 756-766. 1953.

Mazhuga, P. M. THE BLOOD-SUPPLY [?] OF THE KNEE JOINT OF SEVERAL MAMMALS IN THE LIGHT OF ITS FUNCTION. Zool. Zhur. 32(4): 767-779. 1953.

Nasimovich, A. A. EXPERIENCES IN THE STUDY OF ECOLOGY OF MAMMAL PATHS FROM WINTER TRACKS. Zool. Zhur. 27(4): 371-378. 1948.

Radilovskaya, R. G. A FUNCTIONAL ANALYSIS OF THE DIGITS OF SEVERAL MAMMALS. Zool. Zhur. 32(5): 979-986. 1953.

Shaposhnikov, L. V., and F. D. Shaposhnikov. ON THE TOLERANCE OF HABITATION IN THE DESMAN [DESMANA], MUSKRAT AND RIVER BEAVER. Zool. Zhur. 28(4): 373-376. 1949.

Teplov, V. P. ON THE QUESTION OF THE RELATIONSHIP OF SEX AND WILDNESS IN MAMMALS. Zool. Zhur. 33(1): 174. 1954.

Zhedenov, V. N. COMPARATIVE ANATOMICAL CHARACTERISTICS OF THE HEART IN VARIOUS GROUPS OF MAMMALS. Zool. Zhur. 33(6): 1363-1383. 1954.

MAMMALS--COMMUNITIES, NUMBERS, HOME RANGES

Kozlov, V. V. INFLUENCE OF A PROTECTIVE REGIME ON THE MAMMAL FAUNA OF THE MESHCHER LOWLANDS. Zool. Zhur. 33(4): 925-944. 1954.

Lavrovski, A. A., N. P. Mironov, and D. C. Resinko. SPECIES COMPOSITION, DISTRIBUTION, AND NUMBERS OF RODENTS AT YERGEN IN A CLOSED-OFF PLOT OF PUBLIC FOREST. Zool. Zhur. 30(1): 35-43. 1951.

Varshavskii, S. N., K. I. Krilova, and E. E. Lukyanchenko. CONCERNING PECULIARITIES OF THE SEASONAL DYNAMICS OF MICROPOPULATIONS OF MICE AND VOLES IN THE PERIOD OF REDUCED NUMBERS. Zool. Zhur. 28(2): 165-176. 1949. [First appeared in Akad. Nauk SSSR 61: 957-960.]

Translation by D. G. Nichols was placed in U. Calif. library, Berkeley, as "Translations from Russian Biology, no. 2." No. 1 is called "List of the species and subspecies of the avifauna of the USSR" and is from "Guide to the birds of the USSR," by G. P. Dement'ev et. al.

MAMMALS--PARASITES AND DISEASES

Brom, E. P., Z. M. Vovchinskaya, and L. V. Fedorova. ON THE ROLE OF CARNIVOROUS MAMMALS IN THE DISTRIBUTION OF THE FLEAS OF RODENTS. Zool. Zhur. 27(2): 167-174. 1948.

Cherkasski, E. S. RECEPTIVITY OF THE MUSKRAT TO TULAREMIA AND ITS ACTIVE IMMUNITY. Zool. Zhur. 30(6): 636-640. 1951.

Cherkasski, E. S., A. V. Mashkov, and S. E. Sorina. SUSCEPTIBILITY OF THE NUTRIA TO TULAREMIA. Zool. Zhur. 31(4): 571-573. 1952.

Dunaeva, T., N. Olsufev, and E. Tsvetkova. ON THE RECEPTIVITY TO TULAREMIA OF THE COMMON SHREW (SOREX ARANEUS L.) AND THE WATER SHREW (NEOMYS FODIENS SCHREB.). Zool. Zhur. 28(1): 102-104. 1949.

Dunaeva, T. N., and O. S. Emelyanova. ON THE RECEPTIVITY OF THE MUSKRAT (ONDATRA ZIBETHICA L.) TO TULAREMIA INFECTION. Zool. Zhur. 29(5): 459-465. 1950.

Dunaeva, T. N., and N. G. Olsufev. ON THE RECEPTIVITY AND INFECTIVE SUSCEPTIBILITY TO TULAREMIA OF SEVERAL SPECIES OF FIELD VOLES (SUB-FAMILY MICROTINAE). Zool. Zhur. 31(3): 457-466. 1952.

Dunaeva, T. N. EXPERIMENTAL INVESTIGATION OF TULAREMIA IN WILD ANIMALS (RODENTS, CARNIVORES, AND INSECTIVORES) AS THE BASIS FOR STUDIES ON THE NATURAL HOSTS OF THIS INFECTION. Zool. Zhur. 33(2): 296-318. 1954.

Kalabukhov, N. I. SIGNIFICANCE OF RODENTS AS HOSTS FOR SEVERAL INFECTIONS. Zool. Zhur. 28(5): 389-406. 1949.

Kratokhvil', N. I. SOME DATA ON THE INFLUENCE OF TULAREMIA EPIZOOTICS ON CITY POPULATIONS OF THE HOUSE MOUSE. Zool. Zhur. 32(3): 549-550. 1953.

Myasnikov, Yu. A., N. I. Kratokhvil', and V. N. Yanson. ON THE QUESTION OF THE INFLUENCE OF TULAREMIA EPIZOOTICS ON NUMBERS OF MOUSE-LIKE RODENTS. Zool. Zhur. 32(6): 1270-1275. 1953.

Olsufev, N., and T. Dunaeva. ON THE RECEPTIVITY AND SENSITIVITY TO TULAREMIA OF SEVERAL SPECIES OF INSECTIVORES. Zool. Zhur. 29(1): 82-92. 1950.

Olsufev, N., and T. Dunaeva. ON THE RECEPTIVITY TO TULAREMIA OF THE ERMINE, POLECAT, AND FOX, AND ITS POTENTIAL EPIDEMIOLOGICAL SIGNIFICANCE. Zool. Zhur. 30(1): 78-83. 1951.

MAMMALS--SHREWS, MOLES, BATS

Gregoryev, P. P. ON THE QUESTION OF LITTERS OF THE MOLE [TALPA EUROPAEA] IN BELORUSSIA. Zool. Zhur. 33(3): 717. 1954.

Krasovskaya, S. A. ON THE PLANT FOODS OF THE RUSSIAN DESMAN [DESMANA MOSCHATA]. Zool. Zhur. 32(3): 534-538. 1953.

Krasovski, V. P. OBSERVATIONS ON THE REPRODUCTION OF THE DESMAN [DESMANA MOSCHATA] UNDER CONDITIONS OF "FREE" CONFINEMENT. Zool. Zhur. 33(1): 180. 1954.

Pavlinin, V. N. MATERIAL ON RINGED MOLES (TALPA EUROPAEA L.) IN THE URALS. Zool. Zhur. 27(6): 555-562. 1948.

Shilova-Krassova, S. A. ON THE FEEDING OF THE HEDGEHOG (ERINACEUS EUROPAEUS L.) IN THE SOUTHERN WOODS. Zool. Zhur. 31(6): 944-947. 1952.

Spiridonova, K. A. EXPERIMENTS IN THE X-RAY INVESTIGATION OF THE GASTRO-INTESTINAL TRACT AND DIGESTIVE PHYSIOLOGY OF THE MOLE, TALPA EUROPAEA L. Zool. Zhur. 28(4): 382-384. 1949.

MAMMALS--SHREWS, MOLES, BATS--Continued

Tatarinov, K. A. A NEW FIND IN THE U.S.S.R. OF THE LONG-EARED BAT (MYOTIS BECHSTEINII KUHL, MAMMALIA, CHIROPTERA). Zool. Zhur. 32(6): 1276-1280. 1953.

Tupikova, N. V. FEEDING AND CHARACTER OF DAILY ACTIVITY IN SHREWS OF THE CENTRAL U.S.S.R. Zool. Zhur. 28(6): 561-572. 1949.

MAMMALS--RABBITS AND PIKAS

Korzhnev, P. A., and N. L. Goldfarb. SEVERAL ECOLOGO-PHYSIOLOGICAL PECULIARITIES IN THE BLOOD OF HARES (WHITE AND GREY) [LEPUS TIMIDUS AND L. EUROPAEUS] AND THE DOMESTIC RABBIT. Zool. Zhur. 33(6): 1384-1389. 1954.

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